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23 May 1985

Worldwide Report

**NUCLEAR DEVELOPMENT
AND
PROLIFERATION**

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23 May 1985

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NUCLEAR DEVELOPMENT AND PROLIFERATION

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AUSTRALIA

EDITORIAL ADDRESSES URANIUM EXPORT 'CONFUSION'

Sydney THE AUSTRALIAN in English 25 Feb 85 p 8

[Editorial: "Confusion Over Our Uranium Export Policy"]

[Text]

THE confusion surrounding the possible sale of Australian uranium to France by a West German company is a product of the confusion underlying the Federal Government's policy on uranium exports.

Mr Hawke and those of his colleagues who favour the export of uranium, a view shared by most Australians, have not had an easy task in imposing their opinions on the activists of the ALP. In order to prevent our uranium industry from being shut down altogether they have had to compromise; and while compromises are often unavoidable in politics, they are seldom the most logical answer to a problem.

Because of the widespread hostility within the ALP to French nuclear tests it was obvious there could be unpleasant domestic repercussions if it turned out France's tests had been made possible by the sale of Australian uranium. Not surprisingly, the ALP leadership decided to try to avoid potential difficulty by taking the line of least resistance. Its outcome was that the party policy, and therefore that of the present Government, is that no Australian uranium should be sold to France.

It ought to have been expected that it would not take long for the embargo to endanger our uranium export markets. France is a member of the European Community and the community has as one of its most

basic principles the furtherance of free trade among its members.

Consequently, any member nation which attempted to prevent the export to another member of uranium originally from Australia would be in breach of the community rules. It is also possible, although no action in this direction has so far been taken, that the community as a whole could retaliate against Australia if we attempted to discriminate against one of its members.

The rather bewildering controversy which developed last week arose when a West German company let it be known it intended to sell to France 100 short tons of uranium which were part of a consignment purchased under contract from an Australian company.

It would seem that under the terms of Labor policy the Federal Government would be obliged to cancel the contract as the most obvious means of enforcing the ban on exporting uranium to France. The Minister for Trade, Mr Dawkins, has, however, announced the contract will be allowed to stand. His reason is that the German company was not really contemplating the sale to France and it had deliberately and misleadingly allowed the story to circulate so it could be released from a contract it wanted to get out of.

The German company has denied it wishes to terminate the contract and it has reaffirmed it "assumes" the

uranium in question will be used in France. It is impossible for an outsider to tell where the truth lies on the evidence now available. But it seems the Darwin branch of the Waterside Workers Federation is not completely convinced by the Minister and might refuse to load the uranium involved.

If Australia had a monopoly of uranium production this rather farcical episode might not matter. This, unhappily, is not the case and we should take last week's events as a warning that our ban on France is not only ultimately unenforceable but could destroy our access to the entire western European uranium market.

If it seriously wants to take advantage of what could be one of our major export industries, the Government cannot permit the continuance of a ban which could do more harm to Australia than to anyone else. This might involve a fight within the ALP, but it would be a fight well worth winning.

CSO: 4200/768

23 May 1985

HONG KONG

SINO-HONG KONG JOINT NUCLEAR PLANT VENTURE INAUGURATED

Hong Kong HONGKONG STANDARD in English 10 Feb 85 p 1

[Article by Li Wing-on]

[Text]

THE Sino-British agreement on Hongkong has not only resolved a political issue but also marked the beginning of new era of economic cooperation between China and Hongkong.

A vice-chairman of the Chinese Communist Party's Central Advisory Committee, Mr Po Yibo, said the Sino-Hongkong joint venture to build the Daya Bay nuclear power plant, was the most significant link between both places since the signing of the agreement.

Po was speaking at the incorporation ceremony of the Guangdong Nuclear Power Joint Venture Company (GNPJVC) in Shenzhen yesterday.

Po, a close associate of top Chinese leader, Mr Deng Xiaoping, said the setting up of a nuclear plant in Shenzhen was not only to meet the energy need of the mainland, but also that of the Hongkong industry.

"This is China's first nuclear power plant and, at the same time, China's largest joint-venture," he said.

At the ceremony, the top policy-makers of the GNPJVC, a merger of the Guangdong Nuclear Investment Company (GNIC) and the Hongkong Nuclear Investment Company (HKNIC), said they were confident of the project's success.

The GNPJVC chairman, Mr Wang Quanguo, said the project has far-reaching and significant implications for China and Hongkong.

"The completion of this nuclear power station will be of great significance to China's growing nuclear power industry, to the prosperity and stability of Hongkong, to the construction of Guangdong and the realisation of China's four modernisations," he said.

The first deputy chairman, Mr William Stones, who is also chairman of HKNIC, said that he was greatly encouraged by the support given by the Chinese leadership.

He said that the power station would guarantee electricity supplies to Hongkong and the future supply of power would not be subject to fluctuations in the prices of coal and oil.

Stones said the first board meeting of the GNPJVC had been held on Friday in which a division of work on the letting of contracts and negotiations was agreed on.

He said letters of intent would be signed in June with the suppliers of the major plant facilities and the actual contracts would be signed by the end of the year.

GNPJVC director Mr Steven Poon said the company's most immediate task

was to negotiate three main contracts for the reactors, turbine generators and the plant's technological aspects.

He said that several suppliers of these facilities, including France's Frametome and Britain's General Electric Company, had submitted proposals.

It would start negotiating with them seriously in two to three week's time.

He also said that it was discussing a technological cooperation contract with a French power company, Electricite de France.

The Bank of China, responsible for raising 60 per cent of the capital expenditure of the plant, had already identified a consortium of 10 British banks to finance the purchase of two turbine generators for the Daya Bay plant.

Although it is almost certain that the French supplier of pressurised water reactors, Frametome, will get the contract for the plant's nuclear island, other suppliers are still trying hard to win contracts.

The General Manager of the GNPJVC, Mr Pan Yansheng, said the company at present employed 300 people.

He said the board would hold at least four meetings a year in the company's Shenzhen headquarters.

JAPAN

SCIENTISTS TAKE STEP IN FUSION ENERGY PRODUCTION

OW081255 Tokyo KYODO in English 1050 GMT 8 Apr 85

[Text] Naka, Ibaraki, Pref., 8 Apr (KYODO)--Scientists at the Japan Atomic Energy Research Institute took a giant step in harnessing of nuclear fusion as a source of energy, producing plasma in their first test attempt at production.

Using the large-scale tokamak series JT-60 plasma test equipment at Naka, Ibaraki Prefecture, to create plasma (highly-ionized gas with equal parts of positive ions and negative electrons), scientists believe they are taking the shortest route to the creation of fusion energy.

Although plasma generation in Monday's start-up of the JT-60, test model for a future nuclear fusion test reactor, was achieved at conditions far below those required for commercialization, researchers are hopeful that they will make rapid progress.

Construction of the equipment began in 1978 at a cost of 230 billion yen at the governmental research institute in the Tsukuba academic city area, northwest of Tokyo.

Following in the steps of U.S. "TFTR" (1982) and the European Community's "Jet" (1983), Japan's JT-60 is the third known plasma generation testing device.

The institute plans to establish smooth plasma generation in initial testing. Once this had been done, the scientists then hope to be the first to achieve commercial plasma production.

In the generating process, nuclei of hydrogen and other light atoms combine to form energy, imitating a process which takes place in the sun. Heavy hydrogen and tritium compound gases are used to break up the nuclei. Using magnetism, a doughnut shape is created in the pressurized container and plasma is confined.

To achieve conditions necessary for commercial production, Japanese researchers must attain a temperature of 100 million C., an ionized density of 100 trillion per cubic square centimeter and a confinement period of one second.

Monday's test production took place under a temperature of 200,000 C., a density of 10 trillion per cubic centimeter and a confinement period of only 0.08 seconds.

Unlike the U.S. model, which uses heavy hydrogen and tritium in the plasma-producing process, JT-60 researchers have selected hydrogen gas.

Institute head Tsuneo Fujinami, meeting with reporters after the generation test, said, "This is the result of a successful unison of the achievements of basic research, the development of engineering technology and the cooperation of the industrial world."

Fujinami also said that he was confident the test results of JT-60 will serve as important data for a future test reactor.

CSO: 4100/383

JAPAN

BRIEFS

NUCLEAR POWER PLANTS AUTHORIZED--Tokyo, 27 March (KYODO)--The Electric Power Development Coordination Council Wednesday authorized Tokyo Electric Power Co to start construction of two nuclear power plants with a combined capacity of 2.2 million kilowatts. The utility company will at once start construction of the plants, plans for which were started in 1969, at Kashiwazaki and Kariwa in Niigata Prefecture, with the Kashiwazaki plant to be completed in July 1993 and the Kariwa plant in July 1994, at a total cost of 713 billion yen (2.8 billion dollars). Construction began on 11 hydroelectric, thermal and nuclear power plants in Japan in fiscal 1984, with an overall capacity of 6.39 million kilowatts, around 75 percent of the 8.5 million kilowatts initially projected for them by the government. The authorization of the two new plants has brought the number of nuclear power stations to 48, of which 28 are operating, with a capacity of 20.56 million kilowatts. Twelve plants with 11.5 million kilowatts are under construction, and eight with 8.63 million kilowatts are in the planning stages. [Text] [Tokyo KYODO in English 0215 GMT 27 Mar 85 OW]

LARGEST NUCLEAR POWER COMPANY--Tokyo, 29 March (KYODO)--Tokyo Electric Power Co will become the world's largest single nuclear power company in fiscal 1985 with its nuclear power generation against its total electricity production becoming the biggest, the company president has said. Speaking before the press, Sho Nasu said Thursday the company will overtake the Chicago-based Commonwealth Edison Co, which has the world's largest nuclear power generating capacity of about 8.57 million kw, some time this fall. He said the company's nuclear power generating capacity will be boosted from 6.9 million kw in march this year to about 9.1 million kw at the end of fiscal 1985 thanks to planned operation start-up of two nuclear power plants in July and October. Of the total usable electricity generating capacity of 161.8 billion kilowatt-hour planned in fiscal 1985 starting April, nuclear power generation will occupy 32 percent, liquefied natural gas (lng) 31 percent, oil 23 percent, hydroelectric power 10 percent and coal and others 4 percent. The figures in fiscal 1984 were nuclear power, 28 percent, lng 30 percent, oil 29 percent, hydroelectricity 9 percent and coal and others 4 percent. Nasu said nuclear power generation will increase its relative weight to 33 percent in fiscal 1989 and to 41 percent to fiscal 1994. [Text] [Tokyo KYODO in English 0543 GMT 29 Mar 85 OW]

CSO: 5100/4520

NEW ZEALAND

LANGE CONCERN OVER LARGE FRENCH NUCLEAR EXPLOSION VIEWED

HK100154 Hong Kong AFP in English 0132 GMT 10 May 85

[Text] Wellington, 10 May (AFP)--France has carried out what may be its largest-ever underground nuclear explosion at its Mururoa Atoll test site in the South Pacific, New Zealand scientists reported today.

New Zealand seismologists said they recorded a 150-kilotonne blast at 0830 NZ time 9 May (0030 GMT 8 May) at their seismic station at Rarotonga in the Cook Islands.

The previous largest French underground blast at Mururoa gave a yield of 140 kilotonnes, the equivalent of 140 thousand tonnes of TNT.

Yesterday's explosion was the second this year and followed a minor one-kilotonne blast recorded early last week.

France has now exploded nearly 70 nuclear devices underground at Mururoa since it ended testing in the atmosphere in 1975.

In a first reaction Prime Minister David Lange described the test as "deplorable." He said the size of the explosion "gives cause for great concern."

CSO: 5100/4305

PEOPLE'S REPUBLIC OF CHINA

CHINA TO BUILD FOUR NUCLEAR POWER PLANTS IN 5 YEARS

HK181136 Hong Kong HSIN WAN PAO in Chinese 18 Apr 85 p 4

["Special dispatch": "China Buys Nuclear Plant Equipment To Build Four Nuclear Power Plants in 5 Years"]

[Text] Beijing, 18 Apr (HSIN WAN PAO)—Li Peng, vice premier of the State Council, recently declared that China was going to buy some nuclear power equipment from foreign countries in the form of economic and technological cooperation so as to meet China's short-term demand for energy.

"Special Issue on the Nuclear Industry" [HE GONG YE ZHUANG HAO 2702 1562 2814 1413 5714], a large-sized picture album comprehensively covering China's nuclear technology development, is to be published soon. On invitation, Li Peng has written an article for the book to elaborate China's policy on nuclear technology.

Li Peng held that China must do its best to catch up with the world in development of nuclear power technology as quickly as possible, since China started its efforts in the field later than others. However, given the actual economic conditions in China, the country cannot start many projects all at once. According to a tentative plan, four large and medium nuclear power plants are to be built around 1990 and the nuclear power installed capacity is to reach 10 million kilowatts by the end of the century.

In mentioning the four nuclear power plants, Li Peng probably meant the Zhejiang Qinshan nuclear power plant and the Guangdong nuclear power plant, which are currently under construction, and the Liaoning nuclear power plant and the Jiangsu nuclear power plant, which are going to be built. It was said that the provinces of Jiangxi, Sichuan, and Shandong are most likely to build nuclear power plants.

Li Peng is a member of the State Council in charge of energy affairs and the director of the nuclear power leading group of the State Council. He also disclosed that China was now negotiating with the governments or enterprises of France, West Germany, Japan, and the United States and was going to buy elected equipment after comparison.

He pointed out: While importing foreign equipment, China will introduce manufacturing technology through cooperation in production to increase the variety of Chinese-made nuclear power equipment. Therefore, when selecting and purchasing foreign equipment, China will review the suppliers' willingness to export technology as an important factor.

CANADA

CONCERN OVER CANDU REACTOR SAFETY SYSTEM REVEALED

Toronto THE GLOBE AND MAIL in English 9 Mar 85 p 11

[Article by Thomas Claridge]

[Text]

OTTAWA — The major preoccupation of Canada's nuclear regulatory agency in the past decade has been a safety system in the Candu power reactor whose use has never been required, according to minutes of the Atomic Energy Control Board released to the public for the first time this week.

The preoccupation — disclosed in 350 pages of minutes released under the federal Access to Information Act — centres on doubts about the effectiveness of the reactor's emergency core-cooling systems. These systems are the main defence against severe damage when a reactor springs a big leak.

Zygmund Domaratzki, head of the board's reactor regulation directorate, said yesterday that the concerns stemmed from documentation provided by Ontario Hydro in the mid-1970s, when it was building the Bruce A Generating Station near Kincardine. A long-standing design standard in the nuclear power industry requires that if any large steam pipe breaks, the reactor will be kept cool by use of an emergency system that floods the reactor core.

Although the standard has always involved the expectation of some overheating, the regulators had been assured there would be "no significant fuel failure" — overheating so intense that the metal fuel rods start to melt.

If this happened, radioactive byproducts of the atomic fission would escape from the reactor. In Ontario Hydro's multi-unit nuclear plants, the radioactive steam and

gases would be sucked into the stations' vacuum buildings; otherwise, they would collect inside a containment building.

Mr. Domaratzki said the effectiveness of the emergency cooling systems was called into question by computer analyses of the system used for the Bruce A station, which calls for emergency water to be supplied from a 4.5-million-litre storage reservoir in the station's vacuum building. Since the reservoir was about 50 metres above the four reactors, the designers assumed that gravity alone would push the water into overheating areas of the leaking reactor.

However, computer studies produced examples of types of accidents in which the water might not flow unless it was injected at extremely high pressures.

Because of these concerns, the AECB imposed limits on the Bruce reactors' output. More recently, they produced a commitment from Hydro to install high-pressure injection systems at its newer Pickering B, Bruce B and Darlington plants, and to improve the existing systems at the Bruce A and Pickering A stations.

The concerns have also led to a war of words between the AECB's staff and Ontario Hydro, with the five-member control board ultimately compromising between the often-rigid stances taken by the professional regulators and the utility.

Mr. Domaratzki said that when Hydro first sought permission to run the reactors at full power his

staff countered with proposals that would have restricted them to 65 per cent of their rated capacity. When Hydro pressed its case, the control board compromised (in 1978) at 88 per cent. After further pressure from Hydro, the board agreed in 1982 to let the reactors run at 92 per cent.

At the time, AECB president Jon Jennekens argued that the increase of 4 percentage points "only slightly increased" the potential consequences of a worst-case reactor accident.

The motion authorizing the 92 per cent power level left the decision on when and whether to permit 100 per cent output up to the AECB staff, and when the utility came back last year with new arguments for full-power operation it was told it must wait until the improved emergency cooling system was installed. (Part of the \$100-million system is already in place, and the first of the four reactors is to be hooked in to it this spring.)

Examination of the voluminous control board minutes shows hints of emotion-charged debates.

The minutes of a meeting Sept. 24, 1980, tell of a draft report from Hydro dealing with the consequences of a loss-of-coolant accident involving fuel failures (traceable to an ineffective emergency cooling system).

"A preliminary review of this

report indicates possible high radiation fields in the station and, in particular, in the control room," the minutes say. "An in-depth review of this report is currently under way on a priority basis and is expected to be completed in approximately two weeks."

Ultimately, the problem addressed in the report was partly resolved by installing a shielding wall around ducts that would return radioactive water to the vacuum-building reservoir during an accident.

In the minutes of a meeting on March 31, 1981, Mr. Domaratzki says that AECB staff could not confirm a Hydro report that reactor pressure tubes could survive a loss-of-coolant accident.

At the same meeting, board member Dr. Larkin Kerwin described a report on the matter as alarming. The minutes say he "questioned how long it would take to resolve the problem and how long the reactors in question should continue to be permitted to operate."

A few days later, during a meeting with the control board on the subject, a senior Hydro official admitted that the utility's design reviewers had goofed. A report on the meeting, which was appended to the minutes, said Pat Campbell, Hydro's executive vice-president of operations, "stated that Ontario Hydro had not handled this Bruce A design review very well."

CANADA

AECB CONCERNED NRD BUDGET CUTS THREATEN WORKER SAFETY

Toronto THE GLOBE AND MAIL in English 8 Mar 85 p 10

[Article by Thomas Claridge]

[Text]

OTTAWA — The Atomic Energy Control Board has written to the federal Cabinet minister responsible for the National Research Council to complain about budget cuts that could affect the safety of nuclear-industry workers.

The decision to complain to the minister was disclosed in minutes of the AECB's Nov. 19 meeting that were released this week.

The concerns come in the wake of a November announcement that the federal Government would cut \$70-million from the NRC's 1985-86 budget. At that time, the Government said the NRC's nuclear radiation section, a body concerned with nuclear safety, would be eliminated.

The AECB communication with Thomas Siddon, Minister of State for Science and Technology, was authorized in a motion put by board member Sylvia Fedoruk. The motion expressed concern over possible deterioration in the monitoring of workers' exposure to radiation.

The board complained of "reductions and cancellations of the gamma and neutron calibration and standard services provided by the X-rays and nuclear radiations section of the National Research Council to the medical, industrial and research sectors."

A board spokesman said yesterday that the AECB's concerns centre on the need to maintain national radiation measuring standards.

The official said that, at present, major components of the nuclear industry such as Ontario Hydro and Atomic Energy of Canada Ltd. do their own measuring of worker exposure, but always subject to standards and calibrations provided by the NRC. "Take away the NRC standard and the whole system falls to pieces."

Clive Willis, NRC secretary-general, said no final decision has been made on how all the \$70-million in cuts from the council's 1985-86 budget will be carried out.

Mr. Willis said it was "fairly clear that we've got to come up with a good set of standards (for radiation protection), but it's very difficult to determine how much has to be done to maintain such a standard."

CSO: 5120/15

CANADA

MULRONEY AFFIRMS POLICY OF NO NUCLEAR WEAPONS IN CANADA

Vancouver THE SUN in English 16 Mar 85 p A11

[Text] OTTAWA (CP)--Prime Minister Brian Mulroney said Friday his government "inherited" policies that lack "necessary provisions for Canadian sovereignty," but denied that means Americans have a right to base nuclear weapons in Canada.

In a one-hour Commons question period that was part antic and frequently acrimonious, Mulroney accused opposition MPs of "unfairness" for insisting Canadians "have a right to see in clear-cut writing" what they are committed to before signing a new North Warning System agreement with the United States.

New Democrat leader Ed Broadbent said news reports that the U.S. Strategic Air Command will automatically deploy aircraft carrying nuclear weapons to Cold Lake, Alta., in the event of an international crisis raise new uncertainties for Canadians about Canada's policy toward nuclear weapons on Canadian soil.

The exchange in the Commons came just before Mulroney is to meet U.S. President Ronald Reagan in Quebec City Sunday and Monday at a "shamrock summit" to sign a \$7 billion agreement for modernizing radar warning systems against Soviet attack that are based in Canada's far northern territories.

Mulroney said later in a U.S. television interview that Canada will retain "complete control and sovereignty" over the modernized radar system, something which found favor with Reagan who is "very sensitive to Canadian concerns and to legitimate Canadian nationalism."

NDP and Liberal critics have insisted for weeks that the agreement eventually will draw Canada into participation in a U.S. "Star Wars" defence system using space-based weapons to shoot down incoming Soviet ballistic missiles.

Mulroney said Friday that such suggestions are "unfair," and External Affairs Minister Joe Clark reiterated that there will be "no stationing of nuclear weapons in any circumstances on Canadian soil without the agreement of the government of Canada." Unless it is "in the Canadian interest," Clark said, the United States can't put nuclear weapons in Canada.

According to an article published Friday by William Arkin and Richard Fieldhouse, who are associated with the Washington-based Institute for Policy Studies, the U.S. will use Canadian Forces Base Cold Lake, Alta., to station B-52 bombers in the event of a military alert.

CSO: 5120/15

CANADA

NOVA SCOTIA EXTENDS CURBS ON URANIUM EXPLORATION, MINING

Toronto THE GLOBE AND MAIL in English 20 Mar 85 p 5

[Text]

HALIFAX — The Nova Scotia Government will extend a moratorium on uranium exploration and mining for five years while it continues to study the issue, Mines and Energy Minister Joel Matheson said yesterday.

The extension was one of six major recommendations — all accepted by the Government — in a report on uranium mining by Judge Robert McCleave. The recommendations include forming a committee to determine how much uranium will be acceptable in the mining of other minerals and to study new technology in the mining, storing and disposal of uranium.

In his report, which took nearly three years to complete, Judge McCleave included a personal opinion that any future uranium mining should be for peaceful purposes only, such as power generation.

The Government has no intention of using uranium for provincial power needs, Mr. Matheson told the Legislature when he tabled the report.

Another accepted recommendation was that lands now frozen for all mineral exploration because they contain uranium be freed, providing that the uranium content of the ores is below the acceptable level.

Mining industry spokesmen, who have criticized the moratorium, have not seen the report and were not available last night for comment. In the past, they have said the moratorium on all exploration on affected land is responsible for lacklustre interest in the industry in Nova Scotia.

CSO: 5120/16

23 May 1985

CANADA

BRIEFS

NUCLEAR GENERATORS SHUT DOWN--An equipment failure has led to the shutdown of two nuclear generators at the Bruce B plant near Kincardine. The failure is expected to take up to two weeks to correct and will cost up to \$690,000 a day in replacement energy costs, Ontario Hydro spokesman Mike Williams said yesterday. The reactors were shut down after staff noticed a pressure rise in a vacuum building at the plant yesterday morning and later located a tear in a roof seal. There is no risk to plant workers or the public, Williams said. The roof seal tear comes on the heels of a pump failure that shut down a reactor at the Bruce A plant Feb. 5 and cost about \$300,000 a day in replacement energy costs. That reactor went back into service yesterday. [Text] [Toronto THE SATURDAY STAR in English 2 Mar 85 p A3]

CSO: 5120/15

BULGARIA

REPORT ON ACTIVITIES, ACHIEVEMENTS AT NUCLEAR RESEARCH INSTITUTE

Sofia VECHERNI NOVINI in Bulgarian 16 Mar 85 p 4

[Article by Prof. Zhel'o Zhelev and senior scientific associate Ivan Vladkov, both vice directors of the Institute for Nuclear Research and Nuclear Power at the Bulgarian Academy of Sciences: "Scientific Instrument Making and Avant-garde Technologies"]

[Text] A significant part of the Nuclear Power Research Institute's scientific potential is directed toward solving important applied tasks that essentially lead to improving quality and effectiveness in different areas of the national economy. Complex research in the field of nuclear power, whose task it is to optimize the operation of VVER-440 and VVER-1000 nuclear reactors at the Kozloduy Nuclear Power Plant, occupies first place among these tasks. In order to achieve maximum economic results in the reactors' operation, it is necessary to conduct a thorough analysis of their neutron-physical characteristics for reducing the surplus in some operational parameters (provided that accident-free operation of all systems at the nuclear power plant has been attained), and for providing more complete nuclear fuel combustion. For this purpose, and under the leadership of Prof. V. Khristov, senior scientific associate T. Apostolov, and scientific associate L. Subotinov, a number of algorithms and programs were created for the total calculation of the neutron-physical characteristics of the active zone, for modeling and analysis of the working modes when the power supply is higher than nominal, etc. At the same time, with the active participation of scientific associate Il. Penev and I. Marinov, experimental methods were created for determining the exact degree of uranium-235 combustion in the fuel cassettes charged in the reactor.

The implementation of the theoretical and experimental means, created with the collaboration of the Kozloduy nuclear power plant's collective, for studying nuclear power reactors, has made an economic contribution of approximately 6 million leva in 1984 alone. With the growth of our own nuclear power engineering and the increasing number of reactors and their power, the economic effectiveness of these developments will be multiplied.

There is another trend in applied scientific research which is related to nuclear power engineering; the creation and application of modern technologies for deactivating radioactive waste. This research, which has not had any immediate results, has significant social and ecological import. A collective,

under the leadership of senior scientific associate G. Stefanov, has developed and implemented two effective technologies: deactivation of low-radioactivity waste water through foam separation and ion-exchange sorbtion of radioactive isotopes with Bulgarian natural sorbents; bituminization of radioactive salt concentrates on the basis of Bulgarian bitumens. Their use provides for complete deactivation of radioactive waste (with minimal traces) during the operation of the nuclear power plant.

The physical methods for elementary analysis, which are characterized by high sensitivity, rapidity, and technological applicability, are very important for the national economy. Their implementation in metallurgy, for example, allows for the elimination of rather labor-consuming chemical and physical methods for analysis of ores and enriched materials, and for reducing the time for analysis and sharply increasing the productivity of labor.

The institute has developed an apparatus for power-dispersion, x-ray fluorescent, quantitative analysis. This apparatus makes use of the dependence of the power and intensity of the stimulated, characteristic x-ray spectra of the elements analyzed on their atomic number and respective quantity. The apparatus is controlled by the Pravets Bulgarian personal computer; it performs rapid quantitative analyses of almost all elements in the periodic system.

The G. Damyanov Construction and Installation Combine in Eliseyna has implemented such a system with specialized software for automatic determination of the elements' concentration during the analysis of brass alloys. The economic contribution from using it is about 60,000 leva annually. Similar apparatuses are now being implemented at the Osogovo Plant in Kyustendil, for rapid analysis of polymetal ores, and at the D. Ganev State Combine for Lead and Non-Ferrous Metals in Sofia, for alloy analysis. It seems 3-4 such apparatuses could be implemented annually in the near future.

The apparatus and methods for x-ray fluorescent analysis are being developed and implemented by the young collective under the leadership of senior scientific associate Zh. Karamanova, with the active participation of the following specialists: K. Yanakiev, L. Tomov, M. Vuchkov, and E. Nikolova.

Another, no less effective application of nuclear-physical methods is measuring the humidity in different media by means of neutrons. This method is based on slowing down fast neutrons (which have been emitted by an appropriate source), their interaction with hydrogen nuclei, and recording the heated (slow) neutrons thus emitted. As the proper contents of hydrogen in a certain medium are constant in most of the cases, the alterations in its total quantity are due to the humidity changes in this medium. Several types of devices have been developed by the institute for the application of this method. The NVP-79 neutronic hygrometer for soils is one of them; it is designed to measure the humidity contents of soil. The measurements are quite simplified and can be done very quickly: the humidity contents of the soil are read directly in about 25 seconds by a digital indicator. This device is extremely compact; it weights only 6 kilograms and is powered by a rechargeable battery which provides 15 hours of uninterrupted work. This hygrometer has been implemented for operation at the

Bulgarian Academy of Sciences Main Administration and the N. Pushkarov facility in Sofia, as well exporting a number of devices abroad, to Vietnam, the German Democratic Republic, Hungary, Czechoslovakia, Poland, the USSR, the Sudan, Zaire, and Tanzania. International tests of similar devices are being planned by the member nations of the CMEA for mass introduction into agrometeorology in these countries. There are well founded expectations that our country will specialize in their production, according to the CMEA guidelines.

Another application of the neutron method is the methodology already created for a specialized neutron drill for measuring humidity in inert materials during the production of concrete. The drill is connected to the automated control system for production of concrete, Betonkontrol, manufactured and implemented by the Institute for Technical Cybernetics and Robotics at the Bulgarian Academy of Sciences. Together with this system, similar drills have been implemented in the automated production of concrete in four plants, in Pleven, Khaskovo, Ruse, and Devnya. Their implementation at other plants around the country is now being planned.

The neutron method and the respective devices for measuring humidity in various materials were developed by a collective led by senior scientific associate N. Buchvarov, a pioneer here in this area of research.

The examples mentioned above, which in no way represent all of the various activities of the institute in the field of creating and implementing new technologies and devices within the national economy, clearly show the great attention that the Institute for Nuclear Research and Nuclear Power Supply is devoting to the maximum economic effectiveness from the scientific research it has conducted.

12334

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BULGARIA

REPORT ON ACTIVITIES, ACHIEVEMENTS AT KOZLODUY NUCLEAR UNIT

Nuclear Power Meeting Held

Sofia RABOTNICHESKO DELO in Bulgarian 26 Jan 85 p 6

[Excerpts] A meeting of the operational staff was held in the nuclear power station of Kozloduy concerning the accelerated construction of the 5th energy block. The meeting was chaired by Todor Bozhinov, Politburo member of the BCP Central Committee, deputy chairman of the Council of Ministers Ministers, and ministers of energy and raw material resources. The proceedings of building and assembling work at block No 5 and the implementation of the Council of Ministers decision on the accelerated construction of this exceptionally important national project were discussed. Work worth approximately 75 million leva was accomplished on the project in 1984. Labor organization, material-technical supplies, engineering projects, and equipment supplies have improved. Nevertheless, these rates of speed are not sufficient. The operation staff adopted decisions and measures aimed at observing the commissioning schedule set for 1986.

Installation of Turbine

Sofia RABOTNICHESKO DELO in Bulgarian 2 Mar 85 p 6

[Article: "Installation of the Turbine Has Begun"]

[Text] Vratsa, 1 March. This morning a volumetric jack weighing 220 tons was raised and put in place in the seat of the reactor at the Kozloduy Nuclear Power Complex by a mighty Demag crane. Installation of the 1,000 megawatt turbine has begun. By doing this before the onset of spring, the development of an even broader front for construction and installation at the 5th power block has been ensured.

Because of this event, festivities were held at the construction platform. Among those taking part were member of the Politburo of the Central Committee of the Bulgarian Communist Party and First Deputy Chairman of the Council of Ministers Chudomir Aleksandrov, First Secretary of the Okrug Committee of the Bulgarian Communist Party Svetozar Petrushkov, and economic and party activists.

Comrade Chudomir Aleksandrov congratulated the builders and fitters on the beginning of the installation and called for even more determined and inspired labor in constructing the new power capacities. The leader of the Georgi Dimitrov, Power Installation Brigade from the Vratsa Rayon, Ivan Zhabov, read a challenge and promise with regard to rapid completion of installation of this power site, which is important for the national economy.

A business meeting also took place among the leaders of the nuclear power complex, the leading cadres from ministries, trusts, departments, and economic organizations. Comrade Chudomir Aleksandrov spoke about the situation of the power system and the need for rapid work to bring the 1,000 megawatt reactor into the system. He stressed that it is necessary to create those organizations of labor and management which will guarantee the fulfillment of the deadline set by the government.

Kozloduy Record

Sofia RABOTNICHESKO DELO in Bulgarian 3 Mar 85 p 2

[Article: "The Record of the Kozloduy Power Supply Engineers"]

[Text] Vratsa, 2 March. Despite the capricious, difficult winter and the complex conditions of energy production, the four reactors of the First Nuclear Power Plant in Kozloduy worked flawlessly and reliably. Having mastered complex technological processes, the power supply engineers during this period achieved the highest percentage of utilization of the installation's capacities.

As a result of the excellent organization created and the maintenance of high technological and labor discipline, over 2 billion kilowatt hours of electric power were produced in the first 2 months of the year by the Kozloduy Nuclear Power Complex. This is the highest achievement so far, since the start-up in 1974 of the first reactor.

5th Block More Difficult

Sofia RABOTNICHESKO DELO in Bulgarian 11 Mar 85 p 6

[Article by Veselka Marinova: "A Souvenir for the Future"]

[Text] It is difficult to define the feelings evoked by our first nuclear power plant each time I visit it. During the difficult days this winter, the plant did not cease its reliable work. Everything done here by the builders and fitters who are building the 5th power block, by the people involved in operating it, has only one criterion--precision. The scales of construction are huge, the equipment that has to be installed weighs thousands of tons, so that electric power can flow along high-voltage lines in our country from the first 1,000 megawatt reactor outside the borders of the Soviet Union.

The Fifth Stage

I walk along with Dimitur Dinkov, the chief of construction, through the dozens of rooms in the reactor section. We stop at the brigade of Ivan Vasilev from Energomontazh in Varna, which is working on the equipment in the non-hermetic part of the section, we "park" in the hall where the block's control panel for the reactor will be placed. These names are still conditional, because the machines and the complex electronic systems are only now going to occupy their places. And when the reactor starts working, many of the rooms in this section will not be accessible to ordinary people. But that day is still far off. Now the question concerns its approach, not counting off the days. The reactor, which arrived a few days ago, is now at the Kozloduy harbor, and the impressive, complex tangle of metal tubes, which wait to be covered with a concrete skin, is only...its packaging.

A labyrinth of steps, and at the highest step, at the fifth stage (our 5th reactor), is the brigade of twice hero of socialist labor Gospodin Yordanov. "We are working on the so-called critical path--the reactor section," section leader Todor Nonin chimes in. Almost nothing is remembered of the difficulties during this past winter, when the brigade was doing its installation work on 3 shifts at temperatures of minus 20° C. Other things are now bothering the experienced fitter, who had worked on the four reactors before this.

"The apparatus section must have priority in the installation work, but the builders from Zavodski Stroezi in Kozloduy have not secured our work front," Nonin says with a touch of bitterness. "At many places they are just completing the basic repairs on what had already been done, and they've delayed us by 2 to 3 months. The mistakes they made in accumulating fitters and builders are an obstacle. But the 5th reactor is the most complex junction ever installed in the history of Bulgaria."

People use concrete examples when speaking about many of the problems at the 5th power block at Kozloduy. The fitters passed along the bulwarks for the steam generators to the builders in October, and as we see, they are already corroded, but no concrete has been poured. And here they are concerned about clearances of 1 millimeter!

It is easy to see the organizational problems which hero of socialist labor Ivan Stefanov cannot help but remember. The accumulation of various building and installation organizations in the machine hall leads to lack of coordination.

The necessary organization has not been created for maintaining the deadlines, and a number of other unresolved questions are even placed in doubt.

Are the deadlines and the tasks posited for the builders and fitters who are working at the 5th block of the Nuclear Power Complex realistic? The response of the plenipotentiary from the office of the Council of Ministers, Oved Tadzher, needs no commentary: "Every task could turn out to be unrealistic if one does not work hard enough at completing it."

There is, however, an abundance of examples of this. The problem with the lack of supply of equipment is not so acute now. In the machine hall, for example, only 3,000 tons of equipment have not arrived, out of a total of 43,000 tons. "The Little One" is missing, but it would hamper the work now, when the installation has begun at full speed. This is the main thing that must guide the specialists from the Tekhnoimport Foreign Trade Organization.

Workers from the Economic Combine for Heavy Machine Building in Ruse are creating irreparable losses in time, not just mistakes, at the Nuclear Power Complex. Instead of installing the preparatory sections for the steel constructions which they produced, two huge brigades at the sites have been assigned to . . . correct their production. It is hard to see how objective difficulties could justify the collective of our huge combine! It is easy to work with the Scientific Production Combine for checking and welding activities and the factory for sheet metal constructions in the city of Septemvri. The point is not to seek reasons for non-fulfillment, but the possibilities for carrying out the tasks.

The list of obligations of the Ministry of Energy and Natural Resources is also a long one. "The constant shortage of metal": that is how the chief of construction, Dimitur Dinkov, put the problem very briefly. It would be kind to say that people are "waiting on tenterhooks" for the inert materials which the Stroitelni Materiali Corporation must deliver. Waiting for them to arrive has caused a limitation in the usage of concrete, which means that in many locations people are not working at the necessary rates.

And the analyses made by the leadership of the construction show that one of the reasons for not maintaining the deadlines for construction and installation work during the last year was the lower productivity of labor. There are several reasons for this. Marin Gankov, the plenipotentiary of the Ministry of Construction and Rural Development, and of the Energetika Corporation, spoke about them at length: "There are almost no universal installation instruments: the jacks which our machine building organizations do not want to produce, though without them our hands are tied, plus the welding and cutting tools. And the labor force is not only insufficient; those who do come are very often not really qualified."

And for now the okrug people's councils have remained indifferent to the needs of this important national power site. But the Kozloduy plant expects support from them, in terms not only of workers but also of highly trained cadres, who can take on the tremendous responsibility entrusted to everyone who works here, who could work so that there would be no talk of gaps in quality, which are impermissible at such a site.

When I left the Nuclear Power Complex, I could not forget the words of the long-time builder, now deputy general director of the Promishleno Stroitelstvo State Economic Trust, Kiril Kostadinov: "Now, with all the tremendous mechanization which we have, we build sites in twice the time it used to take in previous years." Or the recollection of many people who had worked on the first reactor

there, which was built in the shortest time span in the world, 4 years and 3 months from the first shovel to the start-up. It is true that now the 1,000 megawatt reactor is more difficult and more responsible. But it is possible for these recollections of economical, highly productive labor to be turned into the future criterion of excellent organization, of high quality in building and installation work.

12334

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BULGARIA

INTENSE ACTIVITY AT KOZLODUY NUCLEAR POWER STATION

Cubans as Construction Workers

Sofia VECHERNI NOVINI in Bulgarian 13 Mar 85 p 6

[Article by Filip Tsenov, secretary of the social editorial board of STROITEL at the Kozloduy Nuclear Power Complex: "Friendship is Strengthened in Labor"]

[Text] They have come from far away, but fraternal Cuba is dear to every Bulgarian. 82 young and energetic men have come, the same number as were in the revolutionary detachment on the yacht "Granma."

The Kozloduy builders, who are constructing the 5th power block, accepted them as welcome guests. They accommodated them as friends. And then they went immediately to the construction site.

The first workers to greet them were metal builders, steel workers, and builders from the brigades of twice hero of socialist labor Ivan Dichev and Dimitur Petrov, as well as order bearer Nikola Manasiev.

The language barrier did not prevent the rapid creation of good ties, or the strengthening of production friendship and affirmation of sincere friendship. The Cubans are learning Bulgarian, and our builders are trying to remember words from the guests' language.

Many of the Cubans have no experience in construction. Master builders are therefore becoming involved. Every one of them has taken several young men and has begun to convey to them their professional experience. How many times have the young Cuban hands, together with the calloused palms of the Bulgarians, taken steel rods and woven them into complex reinforced constructs, and have given them the necessary strength and reliability for this grandiose site.

"We are happy that the Bulgarian government has given us the opportunity to take part in the construction of at the expansion of the Nuclear Power Plant here at Kozloduy. We accept that as a great honor and tremendous trust," the leader of the Cuban builders, engineer Jose Presno, said.

He is young, barely 35 years old, and he is trying to learn as much as possible from his Bulgarian friends. And he will take that experience back to his homeland.

"I completed my construction engineer training in the land of the Soviets Presno continued. "The Soviet comrades helped us a lot in acquiring more knowledge. We are now successfully applying this experience in practice. For me and for my comrades, it is pleasant to work side by side with fraternal Bulgarians, with Soviet specialists, with workers from Poland, Viet Nam, and Nicaragua. All of us are at one great front at the site. This helps to affirm unity among the countries of the great socialist community. This makes us strong and proud!"

With every passing day the friendship between the Cuban and Bulgarian builders is strengthened. Sometimes it is difficult for some, or for others. They have to carry out complex and responsible assignments. This is done rapidly, with high quality. Songs break out at such moments over the construction. The Cuban builders sing, and the Bulgarians accompany them quietly.

More than once I have witness a Bulgarian master taking the hand of a young Cuban and teaching him how to bind metal better. These moments make me proud, because we have such industrious people for friends. And this does not apply in just one or two cases. Now, when they are nearing the end of their stay, one can note with satisfaction that 20 of them have recieved good training in complex reinforcement, 23 have grown into excellent metal workers, and 39 are able to handle the most complex welding jobs. More than half of them have mastered a second construction profession.

"The experience which we have acquired at the Kozloduy Nuclear Power Complex is very valuable for us," steel worker Eriberto Masias says. "We will take back with us not only the mastery acquired, but also the pure friendship of our Bulgarian friends!"

This is how Andres Brugar, Miguel Serriano, and dozens of others think . . .

The Cuban builders have passed through a period of great political schooling at the construction site in Kozloduy, under the leadership of the party organization and with the active participation of the trade union committee. In accordance with their desires, they became thoroughly familiar with the resolutions of our congresses and the National Party Conference, with the economy of Bulgaria and the progressive development of the okrug. Members of the Bulgarian-Cuban Friendship Brigade profoundly studied the life and revolutionary deeds of the leading activists in the international communist and workers movement, Georgi Dimitrov. With their labor accomplishments, their behavior, their political maturity, and their moral qualities, they are trying to deserve the right to bear his name.

The Cuban builders are closely following the construction of a nuclear power plant in their own homeland. They are supporting the friendly ties with the Bulgarian builders in the Fidel Castro Brigade, led by Aleksandur Peshev, hero of socialist labor. And that is not all. There are many personal contacts between the various workers. The Cuban speak about the heroic work on the Kozloduy shore, and the Bulgarians about what is taking place on the Island of Freedom.

The friendship, born in the struggle for freedom shared by the two nations, continues to be strengthened in the labor at the two construction sites.

Assembly of 1,000-MW Turbine

Sofia VECHERNI NOVINI in Bulgarian 23 Mar 85 p 5

[Article by Simeon Danevski: "The Atomic Core is Bearing up Under High Pressure"]

[Text] The last days of a severe winter are passing, and it is likely that we will long remember this winter. And when it was most difficult for us, when our frozen rivers and seas did not permit even one ship to pass, in order to bring coal and oil for our power plants, when storms were blowing over the field in Thrace, and the Dimitur Dimov and Maritsa-Iztok 2 Thermoelectric Power Plants were barely working, our hopes then were for the Nuclear power plant in Kozloduy. And it withstood the pressure!

The winter nights were long and strenuous for the power supply engineers who never left their battle posts, lest the electric sun go out even for a moment, there, where it was most necessary. And perhaps at these most truly most difficult moments we understood best what it means to have a powerful nuclear power plant and how correct the party's policy is in constantly increasing its capacity. Because the 4 nuclear reactors which are now producing electric power are obviously not enough to satisfy our constantly growing demands.

"To insure the further development of power supply. To perfect the nation's power supply balance. The relative share of electrical energy produced by the Nuclear Power Plant will reach approximately 26 percent by 1985 and 44 percent by 1990." (excerpt from the Theses of the 12th Congress of the Bulgarian Communist Party)

The 4 reactors account for around a third of all electric power we are now producing. This is not a small amount, and it is more than we had expected, since we began our atomic era only 10 years ago. And now we have already reached the decisive stage of constructing the 5th reactor, the 1,000 megawatt reactor, as they say here. Now more than 6,000 builders and installers are working here, many of them Soviet specialists. Because if we now have a nuclear power plant, we owe this entirely to the Soviet Union, which equipped its huge machine halls. And to the Soviet specialists, who conveyed their rich experience and knowledge to their Bulgarian colleagues, so that now they can be called nuclear power supply engineers.

The 5th reactor is being constructed diligently. The severe winter days at the shore of the great river were no hindrance to those strong in spirit who did not bow their heads when faced with the trials. It is true that ships could not come regularly with machines and equipment from the Soviet Union, but what did arrive and was delivered at the Kozloduy port had to be put in place. And that meant building, building when the thermometer outside showed minus 25 degrees Celsius, when the cutting northerly wind numbed hands, when the metal stuck to them. A whole constellation of heroes of

socialist labor is working there, their brigades are in the front ranks, and a person observing them involuntarily compares their labor struggles with a genuine military battle, especially with regard to the determination and selflessness of thousands of people.

The 5th power block is growing not by the day but by the hour. Try to find, during these days of construction, when the weather is warmer and the "spring offensive" is beginning for the builders and installers, the head of construction, and representative of the office of the Council of Ministers, engineer Oved Tadzher. You will absolutely fail, no matter how armed with patience you might be. Because he is constantly among the workers, constantly moving from one work site to another, following, checking, giving advice, or simply conversing with the workers. And that is how it will be until the reactor is completed, until next year, when its mighty heart will start beating and supplying electric power. That is how it is with other leaders of the combine, who have experienced true satisfaction from worthy fulfillment of their duties during this winter.

Assembly of the 1,000 megawatt turbine has already begun. This is a long and very complex process, because there can be no mistakes here. And of course there won't be any. High in the sky, like an arrow shot from a bow, one sees the largest crane in our country. Down below, trucks, dump trucks, and other conveyances constantly move back and forth. And there are always many people around them. Now they are expecting reinforcements in the form of another 1,000 builders. Because even though spring is coming slowly, it is rightfully coming, and that means that around the reactor section and the machine hall, the two most important sites, things will heat up even more.

"Construction of the 5th power block must be completed by set deadlines, because it is especially necessary for our economy," says engineer St. Georgiev, vice chief director of the Economic Nuclear Power Combine in Kozloduy. "And that means persistent work, in order to succeed in finishing by the deadlines anticipated by the government. Our builders and installers already have experience, and the assistance of the Soviet specialists is the surest guarantee that we will succeed."

We are now seeing the days of testing, testing of mastery and of human will power and persistence. The offensive is being carried out along a broad front. The Kozloduy port has already received the first barges with machines and equipment, which have come from the great land of the Soviets. And everyone is hurrying around the 5th power block, now under construction--every minute is valuable!

12334
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BULGARIA

PROGRESS IN CONSTRUCTION OF NUCLEAR POWER STATION REPORTED

Sofia OTECHESTVEN FRONT in Bulgarian 4 Mar 85 p 1

[Article by special correspondent Radka Nenova: "A Constructed Everest on the Kozloduy Shore"]

[Text] The construction site is brightly lit, even at night; the work does not stop, even when the temperature goes below zero. Despite this lavishness, however, the people at the construction site know the cost of electricity very well. They know as well how much the country needs it now. This is why we carried the many questions from the letters that had piled up in the editorial mail, as soon as the difficulties in power supply had begun. There is hardly any other ministry or administration where our readers could obtain a precise answer than right here, at the 5th power block. We felt this right away, as soon as we found ourselves in the hermetically sealed part of the reactor. As they like to say here at the site, one can go in there only once. Until recently, the ruler of Ivan Lichev's brigade was the sole tenant at the site.

"We made the entire hermetic part and the foundation slab all by ourselves, together with Mariya, the electrician, who turned the lights on for us," Dimitur Velinov began his outline from a rather distant point. He continues his pre-Congress itinerary at the nuclear power station.

About 10 days ago the brigade of Manol Manolov arrived. It was going to rule over the other part, west of the reactor's axis. Old tenants and newcomers scowl at each other, judging from experience the others' know-how. The barely restrained jealousy bursts forth as masculine energy, which, having found an adversary and overcoming it, will work wonders. The first step has already been taken. The Komsomol members in Ivan Lichev's brigade challenged the young people in Manol Manolov's brigade several days ago at a Komsomol meeting.

The work at the reactor has been organized in an interesting way. The reactor is divided into two zones, where builders and fitters are put under the same conditions and have the same schedules. The initial work on installing the reactor is expected to begin in the very near future; its axis will certainly change from being a landmark to a stone of competition.

In the machine hall on 1 March, they tied a big martenitsa on the first equipment of the 1,000 megawatt turbine; thus the Soviet guest, in accordance with the lovely old Bulgarian custom, had the place of honor. Assembly of the turbine, made at the Kharkov turbine plant, has begun. Some of its parts weigh several thousands of tons each, and they have to be fitted precisely, to the millimeter. These requirements, however, are not too much for the brigade of Ivan Zhabov, hero of socialist labor.

"I have worked on construction sites for 28 years; I have participated in the installation of 6 turbines, 4 of which are at the nuclear power plant. My children started school at Kozloduy," the brigade leader says, and his eyes restlessly search the hall. "We are waiting for new reinforcements for the brigade; they should be here any time now. As soon as they come, we will have to go to four shifts, three working and one taking time off. There is a lot of work, there are quite a few new trends in technology, and there is very little time. We have to install the turbine in 1 year, in order to be able to start the reactor in operation."

Ivan Zhabov is not the only one with worries. They will also be shared by the group led by Ivan Lichkov, director of the Energomontazh administration in Varna. They both left their families there, they both came from the big city, and they have a more special way of looking at Kozloduy. Perhaps Ivan Lichkov's desire is well founded:

"Kozloduy should become our own Star City. The nuclear power plant is being expanded, specialists and workers are coming here from different countries, to help, but also to learn how to build. This is why more housing is needed, more stores, workshops, movie theaters, entertainment for the young . . ."

We arrived at the site on the very day when they were selling soft, warm white bread instead of cold, stale bread. Food is of course provided at the canteen. In addition, some vans have been turned into canteens, and workers do not waste time during lunch, they can even rest there. However, if the shopkeepers, who always complain about the lack of space, were a little bit more enterprising, soon other refreshment booths would appear, in addition to the two booths for katma and stuffed pita bread.

In the days to come, 1,200 more people are expected to arrive at the construction site. The entire headquarters is working frantically to provide housing for them, either in the city or in the neighboring villages, to provide bus transportation to the sites, as well as food . . . The okrug, party, and state leadership in Vratsa has been earnestly called on to help. Their schedule here means: today, tomorrow, the day after tomorrow.

We talked with a representative of the Office of the Council of Ministers, construction head Oved Tadzher. He insisted that he has a feeling that the site is not an overflowing spring, but rather a living organism that needs more and more machines and equipment. One more thing:

"We need a lot more specialists. We expect them to come from all over the country, although we do not want to bring people here by force, only those who are aware of the extraordinary significance of this site for the national economy and how important it is to build it fast. There are many things we depend on in order to stick to the schedules: discipline in every unit that serves the site; quality work by the people who manufacture the machines, tools and equipment which we need; the responsibility of everyone involved, directly or indirectly, in the construction."

We do not need to search for another commentary to the readers' letters on the subject of power supply.

12334

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BULGARIA

REASONS FOR DELAYS IN CONSTRUCTION OF NUCLEAR UNIT EXPLAINED

Sofia RABOTNICHESKO DELO in Bulgarian 21 Mar 85 pp 1,3

[Interview with Oved Tadzher, representative of the office of the Council of Ministers and vice minister, by Veselka Marinova, correspondent for RABOTNICHESKO DELO: "Against Time and Difficulties"; date and place not specified]

[Text] Further construction of the nuclear power plant in Kozloduy is an important task that our builders and fitters are right now in the process of solving. What are the unsolved problems at the site? This was the topic of a conversation between Oved Tadzher, representative of the Office of the Council of Ministers and vice minister, and our editorial representative, Veselka Marinova.

[Question] Comrade Tadzher, it is well known that during 1984 the main deadlines for building the 5th reactor were not met. What are the reasons for this?

[Answer] They are complex. After Resolution No 9 of the Council of Ministers had been published, a certain quickening occurred at the site, and some positive changes took place as well. Fulfillment of the monthly plan was even achieved by increasing the number of workers during the months of June and July. The resolution of the Council of Ministers to change to a 3-shift work schedule was not carried out due to a shortage of labor resources, material, etc. A significant decrease in the productivity of labor was allowed, and this cannot be explained by the structure of construction and installation operations. Because of the insufficient supply of materials and tools, the distribution of labor by executive organizations was unsatisfactory.

[Question] Could you point out which administrative organizations did not meet their obligations at the site?

[Answer] It would be easier for me to do it the other way around, that is, to point out those organizations which fulfilled their tasks, because almost all the central organizations and administrations failed to do this. For instance, according to the accounting documents for this project, the necessary labor and materials resources were not provided. The workers who were needed did not show up either. The okrug people's councils did not meet their obligations,

and the cadres sent had extremely low levels of training. The Ministry of Construction and Rural Development did not manage to achieve improvement in the productivity of labor or an increase in natural productivity. Very little was done in implementing new technologies. Three-shift scheduling was not created. The Ministry of Foreign Trade did not sign contracts in time for the delivery of equipment, and this problem continues to be a burden for us in the current year.

The State Planning Committee, the Ministry of Foreign Trade, and the Ministry of Machine Building did not supply the construction site with the necessary mechanical equipment and tools, which is one of the reasons for the decrease in the productivity of labor. The following did not meet their obligations: Metalsnab, Technosnab, Kabelsnab, Khimsnab, Stroysnab, the Ministry of Machine Building for manufacturing equipment and metal constructions, the Ministry of Production and Trade in Consumer Goods. Many of the deadlines for turning projects in were not observed by Energoproekt. The equipment, light fixtures, and electrodes were not delivered on time. Should I go on enumerating more organizations who owe something to the Kozloduy nuclear power complex?

[Question] How would you explain all this?

[Answer] The construction situation for Block No 5 at the Kozloduy nuclear power complex is a quite complex one. This is the first 1,000 megawatt block among the member nations outside the USSR. It is very different from the 440 megawatt blocks built thus far, and its technical level is much higher. It satisfies all the requirements for radiation safety and seismic resistance.

The construction of this block creates a unique experience: it is being designed and built at the same time. A large amount of equipment from the member nations is being constructed right now, which involves changes in draft designs. They are being provided immediately prior to execution.

A number of organs in the country were not able to understand this complexity, they were not flexible enough. In some cases the results obtained were even contradictory: on the one hand, saying aloud that building the Kozloduy nuclear power complex is a first-priority task, and on the other, seeing that questions essentially are not being resolved. The Kozloduy nuclear power complex should be built within the framework of the country's resources and if there were a shortage, this should not be at the expense of the sites. Despite the clear resolutions for a priority, purposeful supply to this site of financial, currency, labor, and material resources, they have not been carried out. This has created an abnormal situation: there are resources available in the country for second-level sites, but not at the national level.

Generally speaking, all of this is due to misunderstanding, underestimation, and in some cases, to unwillingness.

[Question] What should be done to change the situation?

[Answer] There should be an organization of labor, and a devotion to discipline that would match the importance and significance of this site. It is very important to provide the necessary labor force. The work schedule for this year anticipates the need for 3,150 additional builders and installers to come to the site. But quite a bit of time has passed since the beginning of the year, and these people are still not here. But if we are speaking about the cadres, I have to make one thing clear: the kind of workers needed to build a nuclear power plant are not just ordinary workers but ones who are highly trained. The choice of cadres for nuclear power is not a local, but a national question, because other such power blocks should be built in our country. And building nuclear power plants has its own specific peculiarities, technologies, and requirements. Thus it is necessary to create construction and installation organizations that are appropriate for building the 5th power block, not only now but also for our general nuclear power supply. This is a large, strategic question that has to be resolved.

[Question] What is lacking now at the Kozloduy nuclear power complex?

[Answer] We have a lot of problems with supplies of metals and inert materials. Measures must be taken right away to secure instruments, mechanization, appliances, and other devices for labor. There are problems as well with equipment. The truth is that the majority of equipment is not already at the site, and agreements have been signed for other equipment to be delivered by the deadlines, but there is still other equipment which has not been contracted for, and the deadlines for obtaining it will not meet the start-up date. There are many questions to be resolved in the area of housing construction. It would be better to use the housing funds available in the villages near to Kozloduy. Enthusiasm is needed, as well as desire and conviction on everyone's part, because the 5th block must be completed quickly.

The main question is raising productivity, finding and applying new, efficient technical resolutions, which will create possibilities for improving quality and shortening the time required to complete projects. There are many reserves which must be utilized.

12334

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BULGARIA

INTENSIVE CONSTRUCTION WORK AT KOZLODUY NUCLEAR UNIT DESCRIBED

Installation Work At Night

Sofia STROITEL in Bulgarian 10 Apr 85 p 2

[Article by Minka Tosheva: "Each Collective is on the Attack for the First Day of Spring"]

[Text] At the Kozloduy Nuclear Power Unit, even the nights are subservient to the great goal--finishing the construction of the 5th power block on time.

A person should see it all with his own eyes, encounter the windswept faces of the builders and fitters, in order to feel not only the rhythm, but the vigor of responsibility and optimism, the cheerful mood of all this construction.

22 March, the first spring evening. Young people somewhere are perhaps getting ready for a spring ball, but there are hundreds of young people at the Reactor Section with hard hats jammed down on their foreheads and, thinking about the work facing them, they scale the tall heights. And this night, like any other, important technological questions have to be resolved.

This is one of them. Rapid construction of the upper block is continuing over the reactor shaft. The April deadline for beginning has been changed. The engagement has been changed to 27 March, the day when the installation is supposed to begin.

The reinforcing steel fitters and metal workers from the young brigades of heroes of labor Dimitur Petrov and Ivan Lichev have perched like birds on the huge steel body. They are welding and welding....

"This is the ninth 24-hour period we have been working without stopping," the leader of the reinforcing steel fitters, Georgi Ivanov, says. "We have put in 82 tons of concrete steel so far. The deadline is Sunday morning, but we will finish a day or two early."

"My boys have all been on the night shift," unit leader Sasho Markov adds. "We are working even harder tonight, so that we can finish by morning."

After a short break for a cup of coffee somewhere around 2:00 in the morning, they are on the framework again. The electric welding machines sizzle in the skillful hands of dozens of Vietnamese workers.

"We will succeed," Fam Van Bam and Chan Zui Lui announce.

At 6:00 in the morning, the reinforcing steel fitters give up their places to the metal workers.

Unit leader Sasho Markov is not the only one who is satisfied. A smile, which had conquered fatigue, warmed the faces of the young Vietnamese men.

The front was totally given over to the metal workers. After running three shifts, and only stopping for a few days, the units of Dimitur Velinov, Tan'o Kolev, Vasil Goremski, Ivan Zhelev, and Valentin Lozanov have installed more than 30 tons of metal in this unique equipment with much diligence. On this chilly spring night, one "card" after another circles the cylindrical body, the electric welding machines lit up the surroundings, cables are put in place. Valentin Lozanov's boys, Bulgarians, Vietnamese, Poles, pour all their strength into one thing, keeping to the schedule.

Crane operator Kostadin Zhivkov remained on his post for the 2nd 24-hour period.

At what other construction site in this country could nights be turned into days like this!

The brigade leader himself, Ivan Lichev, has not left the work place for four days. Neither has the technical leader, engineer Chavdar Petrov.

"There is no comparison with the difference in the construction of the block down there," Ivan Lichev announces. "What we see now came about in a certain number of days. There is no doubt, on 27 March we will be ready to start the installation work.

On the western side of the reactor section, they are hard at work on building the platform for the Demag crane, which is also a task with a deadline, connected with the installation shaft. Everything has to be ready on 27 March, in the morning, for setting up the 800 ton crane. Under the beaming night lights, two units from the brigades of Spas Spasov and Stamenko Traykov put down the travel panels. Drivers of dump trucks, mobile cranes, and (fadromi) from the Pleven Construction and Installation Administration and Zavodski Stroezi bring sand, tamp it down, lift up and install parts. The work is personally led by vice director engineer Chavdar Savov. Technical leader Khristo Ivanov is convinced that perhaps a new level can be reached in precise instrumentation and electric lighting.

The task is carried out successfully. The deadline is kept. Early in the morning, a team from the Pleven Construction and Installation Administration starts putting the crane in place.

The chilly wind off the Danube does not spare even the first day of spring. The evening is chilly, but higher up, at the 25.70 meter level, it is getting warmer. A collective unit from the brigades of Nikola Manasiev, Stoyan Aleksandrov, Nartsiss Monov, and Petraki Stoimenov is laying heavy concrete into the No 2 Construction Installation Pit, in the basin, for pouring it in the cassettes from the 20.40 to the 25.70 levels. Fixed on the framework, the builders confidently take up the warm containers of heavy concrete, direct it to the right places, and hurry on. The vibrators thunder, by midnight a front must be created for installing the No 1 Construction Installation Pit at the 25.70 level.

Here on the western side of the reactor section, against a background of majestically regular petals, units from the installation brigade of Manol Manolov continue construction of the walls up to the 36.90 level.

On March, at 4:30 pm, in the presence of the leaders responsible for the construction, Soviet specialists, builders, and fitters, the huge, 200-ton block was freed from the preparatory platform and sent to the 27.00 level of the Reactor Section.

Led by twice hero of labor Gospodin Yordanov, the operation was carried out with the powerful Demag crane, operated by crane operator Lyuben Borisov.

Installing the upper block of the reactor shaft is an important stage in the rapid construction of the Reactor Section. They hope, right after it is joined (united) with the neighboring construction elements, the basin from which concrete is poured into the cassettes, and the shaft inspection, pouring the concrete will begin, and that will allow the shaft to be covered up to the 36.90 level.

This is the basis for creating a "clean zone" for the welding of the main circulation turbine pipes and the other installation parts.

Constructing this unique equipment in extremely short periods of time by means of maximal strengthening of the work place is a collective effort of Soviet and Bulgarian specialists and of the workers from three youth brigades, led by the three heroes.

The fitters of Gospodin Yordanov, from the Energomontazh subsection, have installed the rust-proof shell and the foundation parts. Installing the reinforcing steel, the metal facing and air pipes was carried out by the builders of Dimitur Petrov and Ivan Lichev, of Zavodski Stroezi.

The management of the leadership, which has found that this task is an extremely responsible one, has created a precise organization for non-stop, round the clock work and high labor productivity.

All the leaders have displayed true courage and mass heroism in the timely fulfillment of a complex and responsible task.

"The steel fitters and metal workers each changed jackets four times during one shift, because of the rain, but the work did not stop, even for a minute," Dimitur Dinkov, chief of construction said.

When the equipment was going up, Soviet engineer Boris Stepanovich Fenik, author of the strengthening design, announced with obvious joy: "A very beautiful block! The best work! The schedule has been shortened significantly!"

Representative of the Office of the Council of Ministers, engineer Oved Tadzher, gave a high mark for the rapid and high quality work on the upper block.

"The heroes have fully deserved their medals," he announced.

Even more high marks are in order. New tests, new responsible tasks on the 5th power block await.

The joy of successful completion and installation of the upper block on the reactor shaft has not died down yet, and new events are following, one after the other.

1 April. The day is coming to an end, but a new "day" is beginning at the work site of the 5th power block; it is lit by thousands of electric suns, which give birth to new, heroic deeds.

It is 7:00 pm. The powerful Demag crane has lowered a jib over the huge, metallic load. It is the 2nd steam generator, which will be placed at the 25.70 level tonight in the first shell of the reactor section. People from Gospodin Yordanov's brigade are at their posts. Dimo Tabakov's unit is working this shift. His boys are experienced, but still they are agitated, because they are facing a complex and responsible construction and installation operation.

Huge steel cables are suspended from the crane's gaff. Gospodin Yordanov gives directions. Checks are made, so that actions agree with the person in charge of the crane, Min'o Georgiev. The last signal, and it's over! At precisely 9:00 pm the 325-ton load is taken up. New tests await it in the air and at the 25.70 level.

The operation continues. A whole assortment of unique technology is engaged in it. 3:30 in the morning. People are already deep asleep, but there is not even a hint of fatigue on Min'o Georgiev's face.

"We had a lot of problems with lowering the jib," he says. The path crossed many metal construction and frames, which forced a slowdown in the lowering, but the installation went smoothly. The brave guys from Andon Yordanov's unit fought a battle, starting at midnight, for every millimeter it was lowered, for every millimeter of accuracy. It is good that I have contact by radio telephone....

"Let the cable down, turn the jib to the left, a tiny bit, tiny..."

"How much is left?"

"Only 300 millimeters," Andon's voice seems to come from underground.

And again: "Let the cable down, down, down. Stop!" The steam generator is centered on the bulwark blocks. Only now does crane operator Min'o Georgiev take his hand off the controls. And up above, the boys from the Yuriy Gagarin youth brigade, led by Gospodin Yordanov, are getting ready for a geodesic picture. It is 5:00 in the morning. Before the sun's first rays are visible, the red banner has already unfurled over the steam generator, a sign that the task was fulfilled in time.

And again I ask myself, isn't this a feat?!

New Nuclear Reactor

Sofia BTA in English 1706 GMT 4 Apr 85

[Excerpts] Sofia, April 11 (BTA)--Bulgaria's nuclear power generation is gaining "atomic speed." Today assembly work was launched on the first 1,000 MW reactor outside the Soviet Union. It is being mounted within the fifth generating unit of the Kozloduy nuclear power plant. The reactor has been manufactured at the United Works in Izhora near Leningrad. This reactor belongs to a new generation of the "vver" [boiling water] type. The 1000 MW reactor boasts thrice as great thermal power, enhanced reliability and a stable control and safety system.

The experience amassed so far has enabled Bulgaria to move on to a fundamentally new stage in the promotion of nuclear power generation. The new reactor is the first of the two 1,000 MW Systems in the extension of the Kozloduy nuclear power plant on the Danube. The Bulgarian Government has recently decided to build a second nuclear power station, BELENE, again on the Danube. It will have four generating units, each 1,000 MW strong. It will be constructed according to the block system which is believed to be a most advanced one.

12334

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HUNGARY

PERSONNEL OF NUCLEAR POWER PLANT WIN PRIZE

Budapest MAGYAR HIRLAP in Hungarian 4 Apr 85 p 11

[Article by Zador: "The 'Seven-In-Hand' of Paks"]

[Text] The nuclear power station of Paks currently operating with two blocks of 440 megawatts each has, from several points of view, a distinguished place in the economic life of our country and in the history of its technical development. During the hard winter just behind us it was of great significance that the first block (operating since 1982) and the second block (in use since the fall of 1984) were producing 3.7 billion kilowatthours of electric energy instead of the planned 2.7 billion, which is about a tenth of total consumption. The plan for 1985 foresees 5.5 billion kilowatt hours, more than 15 percent of the projected consumption, and, hopefully, Paks will exceed this goal.

It must be added that all this was achieved with the high-level management of a technology that did not have any precedents in Hungary. The power station of Paks is the first installation in our country to apply a leading-edge technology of the second half of the 20th century, that of nuclear power engineering. During construction and startup there were scores of problems, partly because of the novel nature of the technology, partly because of the modifications made in the plans and in the deadlines for the delivery of equipment. It is obvious that realization of this project and the surmounting of the attendant difficulties has required extraordinary efforts from the persons who are being honored now, and from the hundreds and thousands of people who stand behind them.

Right now the third block is being built at Paks. The complete power station consisting of four 440 megawatt blocks should be ready by 1987, according to the plan. There are also plans for putting in additional blocks before the turn of the century. According to calculations and measurements the Danube can provide cooling water to the power station up to an output of 6000 megawatts, taking into consideration the impact on the environment. By the way, it is mainly the nuclear power capacity to be installed that will be called upon to satisfy the yearly increase of 300 megawatts that will occur to the end of this century.

It is evident that it is very difficult to select and isolate the contributions of a few people from among the planners and managers of such a large enterprise; nevertheless, in what follows we will attempt to sketch in broad outline the contributions of the seven experts who have received the State Prize.

Istvan Feher, a radiation physicist and chief division head of the MTA Central Physics Research Institute, had an outstanding role in the creation of an environmentally safe system that is exemplary even by international comparison.

Jozsef Kordis, the now retired director of Eroterv, was the director of planning in Hungary since 1966, since the conception of the idea of the power station. He played an outstanding role in working out the agreement of plans.

Tibor Laczai Szabo, chief adviser of the Ministry of Industry, was involved with the power station since 1966. Since 1978, the creation of the State Startup, Control and Acceptance Committee, as the committee's secretary, he assumed the difficult and responsible job of coordinating the startup permits. By the way, the outstanding safety of the power station is partly due to the unyielding rigor of the experts and the various forums participating in the acceptance process, and the practice of totally neglecting any plans for acceptance by certain pre-set dates.

Jozsef Polya, the director in chief of the Nuclear Power Corporation of Paks whose chief engineer he was previously, has assembled a young and productive group which has superbly completed its tasks under his direction. He had also developed a very good relationship with the experts working at other power stations of a similar type.

The life of Benjamin Szabo, the chief director of the National Long-Distance Power Transmission Corporation, is closely linked with Paks. Since 1966 in different positions he was the dynamo of construction, first as a liason of the ministry, then as a director, then in 1978-82 as the government liason. It was his responsibility to coordinate and facilitate the work of the huge company that reached the size of ten thousand workers at its peak. This effort demanded great mental and physical capacities.

Geza Szabolcsi, the deputy technical director of the Power Station Investment Company who was party to the construction of virtually every power station built so far, has successfully handled an investment that has exceeded in magnitude all others to date.

Lajos Voross, the chief division director of the Research Institute for Industrial Electrical Power, had an outstanding role in the establishment of atomic power research at the Institute. With his young, talented and well-trained coworkers he has achieved very good results in safety analysis and the examination of vacuum spaces, among other fields.

12846

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ARGENTINA

PRC NUCLEAR ACCORD 'PROBABLE' DURING CAPUTO'S VISIT

HK140708 Hong Kong AFP in English 0650 GMT 14 Apr 85

[Text] Beijing, April 14 (AFP) — China is likely to sign a nuclear cooperation accord with Argentina, which is already advanced in the nuclear field, the Argentine Embassy said here today. An embassy spokesman said it was "probable" the agreement would be signed during the visit here of Argentine Foreign Minister Dante Caputo, who arrived in Beijing yesterday. No details of the proposed document were given. Argentina is one of the eight leaders of world nuclear technology. As well as two working nuclear plants, a third is being built and a fourth planned. Buenos Aires has also developed its own uranium enrichment facilities. A team of Chinese experts last year visited the country to tour its nuclear projects.

To combat a serious energy shortage, China has mapped out an ambitious nuclear programme, with plans to build ten 1,000-megawatt plants by the year 2,000. The country still has no operational nuclear power stations but is negotiating with Western firms towards building four plants: one in Guangdong, South China; a second in East China's Jiangsu Province, and two more in northeastern Liaoning. Beijing has signed nuclear cooperation agreements with France, West Germany and also with another South American country, Brazil. China has not signed the nuclear weapons non-proliferation treaty -- one of the factors blocking similar agreements with Washington and Tokyo.

The Argentine minister is today to start talks with his Chinese counterpart Wu Xueqian and will also visit a factory, the spokesman said. During his stay Mr. Caputo is also scheduled to meet President Li Xiannian, Prime Minister Zhao Ziyang, and Foreign Trade Minister Zheng Tuobin. Bilateral trade currently runs in Argentina's favour, with Buenos Aires selling an annual 350 million dollars' worth of grain to China in recent years. China's exports to the South American republic, comprising largely textiles, were valued at 20 million dollars in the first six months of 1984.

CSO: 5100/2090

ARGENTINA

CAPUTO ON NUCLEAR ACCORD WITH PRC, OTHER ISSUES

TELAM Report

PY171613 Buenos Aires TELAM in Spanish 1456 GMT 16 Apr 85

[Excerpts] Buenos Aires, 16 Apr (TELAM)—Argentine Foreign Minister Dante Caputo has asserted that the nuclear energy cooperation agreement signed with the PRC yesterday should fill us with pride, since there are not many countries in the world that have achieved our scientific and technological development. Caputo also said that the PRC authorities expressed coinciding points of view on the way we focus on the foreign debt problem.

The minister said that under this agreement, Argentina could grant technical aid to the PRC, since our technical development is more sophisticated than that of the PRC. Our decision to use nuclear energy for peaceful purposes has allowed us to carry out research in the scientific and technical field, which is something that has not happened in the PRC.

During a telephone conversation from Beijing with Buenos Aires Radio Rivadavia, Caputo asserted that this agreement is a broad framework agreement that refers to nuclear energy plants, the fuel cycles, low-power reactors, training, transfer of technology, and other matters.

Caputo noted that any transfer of technology will be carried out under the full safeguards of the International Atomic Energy Agency [IAEA] and that such a transfer will only be used for the peaceful development of nuclear energy.

The foreign minister noted that the agreement was negotiated very quickly since talks only started in late October. He added that it should be recalled that the PRC foreign minister visited Argentina in August, which is when we first brought up the subject. After that we made rapid progress. I would say that we started negotiations in November and ended them some 15 or 20 days ago. This is a very important step.

Caputo, who termed the PRC an emerging giant, said that all this reveals Argentine capacity to sell and market its technology, which is in fact one of the things we are interested in. He added that the text of the agreement will be disclosed very soon since it has no secret clauses. The text is very clear.

23 May 1985

However, I think that as a consequence of this coincidence of views regarding international issues and the practical interests we share, the PRC regards Argentina as a country that has potential and interests that may contribute to the development of their own nation. I believe that the length of my meeting with the PRC prime minister was due to the PRC's desire to stress the importance they grant our country.

More Details on Agreement

PY171432 Buenos Aires NOTICIAS ARGENTINAS in Spanish 1600 GMT 16 Apr 85

[Text] Buenos Aires, 16 Apr (NA) -- It was learned from official sources today that the technical cooperation agreement for the peaceful uses of nuclear energy that was signed by Argentina and China in Beijing yesterday will reportedly include the possibility to jointly carry out the construction of nuclear plants and research reactors, the fabrication of fuel elements, and the exchange of information and scientists.

Sources indicated to NOTICIAS ARGENTINAS that the text of the agreement will publicly be released only after the document is sent to the IAEA in Vienna and the U.S. State Department.

The 12-article agreement is being kept in total secrecy by the Argentine and Chinese Governments for the reasons already mentioned, but the sources said there are "many similarities" with the agreement signed by Argentina and Brazil last year, especially in Article 2. The sources also denied foreign press reports indicating that the Chinese delegation which came to Argentina last year visited the enriched uranium production plant in Pilcaniyeu, Neuquen, where Argentina keeps its process an industrial secret. They explained that the agreement with Beijing does not yet involve any concrete projects, although there are several that could be carried out within a short time.

Although Argentina and Brazil signed a similar agreement last year, they have not yet carried out any joint projects within the framework of the agreement.

The agreement signed by Foreign Minister Dante Caputo and his Chinese counterpart, Wu Xueqian, yesterday in China also reportedly include the production and application of radioisotopes, the study of nuclear security regulations, and the use of consultants. The agreement reportedly also includes the joint processing of minerals and uranium and cooperation in nuclear medicine.

China is a nuclear power, but it has no nuclear energy plants and has not signed the Nuclear Nonproliferation Treaty.

CSO: 5100/2093

ARGENTINA

FOREIGN MINISTRY NOTE ON PRC NUCLEAR AGREEMENT

PY252350 Buenos Aires TELAM in Spanish 1925 GMT 25 Apr 85

[Text] Buenos Aires, 25 Apr (TELAM) -- The Argentine Foreign Ministry today released a communique in which it calls the agreement on cooperation for the implementation of the peaceful uses of nuclear energy signed between Argentina and the PRC an unprecedented opportunity for the Argentine Republic in the nuclear field.

The document states that through an ambitious project, the PRC plans to build 10 nuclear power plants over the next 15 years and emphasizes two basic aspects of the policy being implemented by the PRC authorities. The first aspect is intensive cooperation at an international level to promote the peaceful uses of nuclear energy. The second aspect is the safeguarding of world peace since the PRC has nuclear weapons, but it has stated that it will never be the first country to use them, adding that in no way will it use nuclear weapons against those countries which lack such weapons.

The agreement, on which unofficial reports have been disclosed, states that the materials or equipment transferred between the two parties, as well as the materials derived from the utilization of that equipment, will be used for peaceful purposes only. In addition, the two countries commit themselves to ask the International Atomic Energy Agency [IAEA] for the implementation of safeguards for the materials and equipment transferred under the agreement.

The communique also states that, thus far, the PRC has signed this type of agreement with Brazil, France, and the FRG, and is holding talks with Belgium, Japan, and the United Kingdom. It must be noted that after holding innumerable and complex negotiations with the United States, the PRC has only achieved the initialing of just one agreement.

As a closing comment, the press communique issued by the Foreign Ministry states that the cooperation agreement, which constituted one of the culminating points of the tour that Foreign Minister Caputo made to the PRC and the ROK, has earned favorable comments because of the acceptance of the IAEA's safeguards.

The text of the agreement, stating that the utilization of nuclear energy for peaceful purposes constitutes a significant factor in promoting the social and economic development of the two countries to achieve their own progress, was distributed along with the communique.

The 10 articles of the agreement insist on the essence of a mutual respect for sovereignty, nonintervention in domestic affairs, and equality and mutual benefits to cover the needs and priorities of their national programs for nuclear development. The areas of

cooperation between the parties are then enumerated, namely the research, design, construction, and operation of nuclear power plants and reactors; the exploration, mining, and processing of uranium minerals; the engineering, manufacture, and supply of nuclear fuels, including the necessary components and materials for use in reactors; the disposal of radioactive waste; the production and application of radioisotopes; radiological protection and nuclear safeguards; the safekeeping of nuclear materials; and other areas of common interest.

The cooperation will be implemented through the exchange and the training of scientific and technical personnel, the exchange of information and papers, the holding of symposiums and seminars, the reciprocal transfer of equipment and services linked to the above-mentioned areas, the granting of stipends and scholarships, the establishment of joint work groups, and other ways of cooperation that the parties deem appropriate.

One of the restrictions stipulated is that the contracting parties will use all information exchanged except in those cases when the supplying party has previously reported on restrictions concerning its use and distribution, and that the parties commit themselves to exchange the equipment and materials for peaceful purposes and the same will not be moved outside the territory of the receiving party unless otherwise agreed by the two nations.

The agreement will be effective for a 15-year period and will be automatically renewed every 5 years unless one of the two parties voices its intention to cancel 6 months in advance.

CSO: 5100/2095

ARGENTINA

CONSTANTINI, LAPENA DIFFER OVER 1985 CNEA BUDGET EFFECTS

Buenos Aires CLARIN in Spanish 13 Mar 85 p 17

[Text] The scheduled budgetary funding for the National Atomic Energy Commission [CNEA] in 1985 will assure continuity in the construction of two projects: the third Atucha II nuclear-electric power plant and the heavy water industrial plant which is being built in Arroyito. This information was underscored by Engineer Jorge Lapena, undersecretary for energy planning, after he had said, from the viewpoint of the Secretariat of Energy, "The budgetary allocations for this year will meet the expansion requirements."

Atucha II

Lapena revealed that the \$250 million to be earmarked for Atucha II will make it possible to continue construction with a view to placing the power plant in operation in 1990. Similarly, the funding of \$120 million for the heavy water plant is intended to ensure that the Arroyito installations will be operational in 1987.

These statements are at variance with those made recently by the head of the CNEA, Alberto Constantini, who said, "The budget of \$420 million will not ever permit completion of the work plans for the Atucha nuclear power plant or the heavy water plant."

These opinions, which were voiced before deputies of the lower Chamber's Science and Technology Committee, included a veiled but express criticism of the "rigid plan of the Secretariat of Energy."

Alternatives

According to Lapena, even though the new energy plan being promoted by the Secretariat (in replacement of the equipment program whose first formulation dates back to 1979) focuses on the development of hydroelectric resources, it also envisions the installation of a series of nuclear-electric power plants which are expected to provide 1,000 MW, once Atucha II has been placed in service.

What has not yet been defined is the module of these power plants. Considering the fact that estimates for growth in demand calls for only

1,000 MW of nuclear-electric power, the problem consists in deciding whether a single gigantic plant or three smaller units of 300 MW each will be built to supply that power. In the opinion of this official, the latter alternative would be "adequate for the industry associated with the construction of these power plants and would also be more acceptable to the electric system to the extent that the potential effects of a delay in the execution of one of the projects would be diminished."

8143

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ARGENTINA

COSTANTINI: PROBABLE SERIOUS SETBACKS TO NUCLEAR PLAN

Buenos Aires CLARIN in Spanish 18 Mar 85 p 5

[Text] All Argentine nuclear activity, except for two projects under construction, will be paralyzed for a year if the budget allocated to the area is reduced, according to the president of the CNEA [National Commission for Atomic Energy], Alberto Costantini, yesterday.

He explained that if the reduction that the Secretariat of Finance advocates limits CNEA funds to \$420 million, only the construction of the third nuclear powerplant, Atucha II, and the Arroyito heavy water plant will continue.

Costantini considered the amount allocated to the CNEA in the national budget bill inadequate. He denied that these reductions respond to "demands from the IMF (entity with which the foreign debt of the country is being renegotiated) or U.S. pressures."

He added that the limitations of funds for the CNEA will also produce "frustration, discouragement and perhaps migration, within and outside the country, of many scientists, professionals and technicians who work on those activities that would be paralyzed."

He also said that \$300 million of the \$420 million in the budget will be allocated to Atucha II and the other \$120 million for Arroyito. These projects are basically under the auxiliary private nuclear industry.

Costantini told the AFP that the CNEA activities that would be paralyzed include completion of the uranium enrichment plant in Pilcaniyeu, completion of the heavy ions accelerator that is already a year behind and expansion of the nuclear manufacturing complex in Cordoba Province.

Also the exploitation of uranium deposits and other minerals in Sierra Pintada (Cordoba) and the production of special alloys for the production of zircaloy pipes (used in nuclear reactors) would be affected.

All the research and development activities of the nuclear centers in Mendoza, Constituyentes and Ezeiza would be paralyzed.

7717

CSO: 5100/2091

ARGENTINA

CNEA OFFICIAL WARNS LEGISLATORS OF BUDGET CUT EFFECTS

Bahia Blanca LA NUEVA PROVINCIA in Spanish 19 Mar 85 p 4

[Text] San Carlos de Bariloche (DYN)--Yesterday the chairman of the energy committee of the Chamber of Deputies, Guillermo Tello Rosas, supported the research program that the CNEA [National Commission for Atomic Energy] is carrying out. He stated that "the technology and level acquired in the nuclear field" by Argentina is "unrenounceable."

The UCR [Radical Civic Union] deputy is in Bariloche on a working tour with legislators from the energy committee of the lower house. The objective is to learn about the situation of the Bariloche Atomic Powerplant, the Pilcaniyeu uranium enrichment plant, INVAP [Applied Research Institute] and the Balseiro study center.

Tello Rosas stated that Argentina "will no longer be a nice little republic like Jose Martinez de Hoz and all his henchmen wanted." He stated that nuclear research "will not be risky" since it is our patrimony, "unrenounceable and indispensable in order to achieve the great fatherland we want."

Earlier, the UCR legislator had participated in a meeting with the director of research and development of the CNEA, Mario Mariscotti. He warned the deputies: "Argentina is risking one of its main sources of income by neglecting its research potential." Its budget is "10 percent" of the amount allocated to that organism.

Mariscotti discussed "the stage of research in Argentine nuclear technology" and exhorted the legislators to "speed up finalization of the 1985 budget" so that all this work "is not at risk."

Mariscotti protested to the deputies: "With our current accounts, we will have to turn out the lights in the laboratories in a month." He indicated to them: "It is not a matter of having more but of really knowing how much money we have. We basically understand the crisis situation of the country."

Mariscotti also went into the uranium enrichment processes that the CNEA carries out in the Pilcaniyeu laboratories. He pointed out "the political and economic value" of that scientific practice. He called it "a political lever" for the country in the international community.

The CNEA executive then denied the criticisms against Argentine nuclear independence. He stated: "Any American who has access to a satellite knows that, due to the dimensions of the Pilcaniyeu laboratories, it is impossible for us to make bombs here."

The energy committee of the lower house will release a document today entitled "Bariloche Statement." It will confirm the legislative branch's interest in supporting the Argentine nuclear plan despite the need to "delay the development of the program" for budget reasons.

Tello Rosas indicated that some cuts could be made in the amounts allocated to the Atucha II powerplant and the heavy water plant in Arroyito, Neuquin, to "guarantee their realization without hurting the study and research programs of the CNEA."

7717

CSO: 5100/2091

ARGENTINA

LEGISLATORS VOICE STRONG OPPOSITION TO NUCLEAR BUDGET CUTS

Bahia Blanca LA NUEVA PROVINCIA in Spanish 23 Mar 85 p 5

[Text] A statement on the National Atomic Energy Commission (CNEA) was released yesterday with the signatures of national Justicialist Deputies Carlos Ferre, Luis Sobrino Aranda, Mario Alberto Gurioli, Raul Druetta and Hector Basualdo. The document makes a general reference to the importance of this agency in terms of research and the training of technicians and scientists, the search for uranium deposits and reserves to be converted into fuel, and the development of technology which can earn foreign exchange in the short term.

In another part of the statement, the legislators indicate that last year, the Energy Secretariat claimed that the development of the nuclear plan was of no importance whatsoever, and the Finance Secretariat strangled the CNEA financially by releasing only 4 percent of the funds originally allocated. "When we defended the development of the nuclear plan last year," they allege, "we were told that there would be surplus electricity, since demand was depressed. Today, however, there is an urgent need to put Atucha II in motion by 1990 because of the energy needs Argentina will have at that time. How is this possible?"

Later on, the legislators mention the \$100 million cut from the \$550 million initially promised by President Alfonsin, noting that "this cut delivers the coup de grace to the nuclear plan as it prevents the completion of Atucha II and the Heavy Water Plant, and drastically slows down the LPR (plutonium reprocessing), Pilcaniyeu (enriched uranium), and Tandara (heavy ion accelerator) projects and all areas of research and development that are currently underway."

They conclude by saying that the "irregular flow of funds from the Finance Secretariat, in our view, has but one motive: to impede the sovereign development of the Argentine nuclear plan." They stress that we must not allow "the possibility of becoming a sovereign nation to be stifled for reasons of austerity; the kind of 'austerity' entailed in the IMF's schemes can only bring more misery."

8926

CSO: 5100/2085

ARGENTINA

SWISS BANK ORDERED TO SUBMIT DATA ON EMBALSE ACCOUNT

Buenos Aires LA RAZON in Spanish 21 Feb 85 p 20

[Article by Raul Dellatorre]

[Text] A Swiss bank must provide details on one of its accounts to the Argentine Government, in connection with an alleged \$5 million kickback for awarding the contract to build a nuclear power plant, says a dispatch from the Reuters Agency, datelined Lausanne, Switzerland. According to a ruling handed down yesterday by a Swiss federal court, the Trade Development Bank of Geneva must provide information on an account a former Argentine minister opened in that bank. According to Reuters, court documents identify the man as Jose Ber Gelbard, who died in Washington in 1977.

The bribe was allegedly paid in connection with the sale of an atomic reactor for the Embalse Nuclear Power Plant, located in Rio Tercero, Cordoba. This nuclear complex is the second one built in the country (the first was Atucha). It took 8 years to build, with an investment of approximately \$1 billion, and it began operations in May 1983. Operating at full capacity, it can produce 600 megawatts.

Although the final contract was signed during the Peron government, the decision on awarding the original contract to the consortium comprising Atomic Energy of Canada Ltd. (AECL) and Italimpianti of Italy, was made by the military government that stepped down in May 1973. In March of that same year, the National Atomic Energy Commission (CNEA) accepted the Italo-Canadian offer to build the nuclear power plant, one day after the government junta had decided to use natural uranium instead of enriched uranium to power the plant.

As the CNEA stated on that occasion, the Canadian reactor was selected from several bids because of the technological advantages it offered and the opportunity for Argentine industry to participate. At that time, the minister of public works and services was Pedro Gordillo, and the economy minister was Jorge Wehbe.

The final agreement to award the contract was signed by the CNEA and the Italo-Canadian consortium on 20 December 1973, and was approved by the Executive in March 1974. At that time, Jose Ber Gelbard was finance minister, and the undersecretariat of public works and services was under his jurisdiction.

Horacio Zubiri was secretary of public works and services during that period, succeeded by Jorge Haiek.

The scandal over the "atomic kickback" (as it was labeled then) broke out in late 1976 as a result of the investigation begun by the Canadian Parliament, due to AECL's failure to provide proof for a total of \$2.5 million in commissions to foreign representatives for mediating in the transaction to sell the reactor to Argentina. The Italian firm Italimpianti was implicated in the investigation as the alleged middleman in the payment of the kickback, which allegedly totaled \$5 million counting the contribution by the Italian company.

According to a report by the EFE press agency, datelined Bern, Switzerland, in November 1977 "the illegal payments for the sale of the atomic reactor for the Rio Tercero power plant were supposedly deposited in a Swiss bank when the military regime headed by Gen Alejandro Lanusse was still in power in Argentina." The report adds that AECL "appears to have paid \$2.5 million—the other half was paid by the Italian company Italimpianti—to an Argentine middleman who won the sale of the reactor. His identity is not known, as he went by the name of Opera."

The dispatch goes on to report that "the kickbacks, according to our sources, were deposited in a bank in Geneva on 16 May 1973," before the Peron government took office.

A report published at about the same time by the Bahia Blanca newspaper LA NUEVA PROVINCIA claimed, however, that it was Jose Ber Gelbard who collected that \$5 million commission. This information came out in the middle of a campaign that had begun a year earlier to discredit the former minister and other officials of the Peronist government that was overthrown in 1976. It should be noted that LA NUEVA PROVINCIA openly supported the ideology of "The Process," primarily in its initial years; in its editorial pages it praised the right-wing, totalitarian stance of the military regime.

The Swiss federal court's ruling that the Geneva bank must provide information to the Argentine Government comes in response to the investigation initiated by the National Administrative Investigations Office in 1977 to look into the alleged kickback scheme. The investigation was given new impetus when Dr Ricardo Molinas was named to head that agency.

8926

CSO: 5100/2085

ARGENTINA

BRIEFS

CONSTANTINI CALLS URGENT MEETING--Buenos Aires, 14 Apr (NA)--Alberto Constantini, chairman of the National Atomic Energy Commission (CNEA), has asked for an "urgent" meeting with President Raul Alfonsin this week to discuss the serious budget shortages which this organization is facing. Constantini will ask Alfonsin to finance not only the construction of the Atucha II power plant and the Arroyito heavy water plant as set forth in the 1985 draft budget, but also the rest of CNEA's activities, especially research and development. The sources admitted the possibility that the current problem could be solved by changing the guidelines of the current budget which allocates \$300 million to Atucha II and \$120 million to Arroyito, leaving the rest of CNEA's activities without funds. They added that this solution "would require an explicit order from President Alfonsin." If the current draft budget is not amended, projects such as the Pilcaniyeu uranium enrichment plant and the heavy ion accelerator known as Project Tandar. [sentence as received] [Text] [Buenos Aires NOTICIAS ARGENTINAS in Spanish 2258 GMT 14 Apr 85]

NUCLEAR FUNDS CONCERN--Buenos Aires, 16 Apr (NA)--The Argentine Association of Nuclear Technology expressed at noon today its "profound concern over the future of nuclear development" in Argentina and predicted "difficulties in continuing to work responsibly in this field." In a press communique released at noon today, the association, which includes professionals and private enterprises, warned that difficulties "can result from unrealistic budgets and the inadmissible delays in the transfer of funds." This organization asked the government to prepare "a medium- and long-range realistic nuclear program" and to establish "control mechanisms to preserve the budget," among other requests. The communique points out "the discrimination affecting the nuclear sector in the transfer of budget funds and the need to strictly enforce the budget." In conclusion, the communique says that "the nuclear sector can and should effectively contribute to the solution of the current economic problems and to especially prevent these problems from occurring again in the future." [Text] [Buenos Aires NOTICIAS ARGENTINAS in Spanish 1545 GMT 16 Apr 85]

CSO: 5100/2093

BRAZIL

PRODUCTION OF ATOMIC BOMB EXPECTED IN 1990

PY291615 Sao Paulo FOLHA DE SAO PAULO in Portuguese 28 Apr 85 p 25

[By Leila Reis]

[Text] Brazil will have its atomic bomb in 1990. To attain this objective, several scientists are conducting a parallel nuclear program, independent of the agreement signed with the FRG and free of international safeguards. There is so much confidence in the program that a former military minister has given assurances that the bomb will be ready by the end of the decade.

Military sectors have justified the parallel nuclear program, which some people prefer to call autonomous, on the grounds that the developed countries are exercising pressure to prevent other countries, particularly Third World countries, from developing the technology of the complete nuclear fuel cycle. This cycle includes uranium enrichment, fuel reprocessing, and separation of plutonium.

The explanation for the decision to develop this technology, which will allow the country to build nuclear weapons, is based on the premise that if Brazil shows to the world that it can build the bomb, it will gain international prestige, just as India did in 1974.

The ability to build the bomb will give Brazil considerable power and political weight. Thus, the former minister believes that Brazil must show that it can build one by itself. Brazil does not need an atomic arsenal, because it is not embarking on a militarist policy. However, the source believes that it is important to detonate at least one bomb.

The first Brazilian nuclear blast might take place in an area in Cachimbo district in southern Para, where the Armed Forces Staff has maintained, since the 1970's, a large field for firing exercises and for missile and rocket launches, which has not been used yet. Another possibility is Martin Vaz Island, near Trinidad Island in the Atlantic Ocean, 1,200 km east of Vitoria.

The Brazilian bomb is being built in parts, that is, individual institutions are in charge of the development of each stage of the fuel cycle technology. The Navy is carrying out research on the fuel that will serve, in principle, for a submarine reactor. The Air Force is trying to develop nuclear fusion technology through laser techniques. No one has ever disclosed this part of the program.

The Navy is carrying out its research at the Institute for Nuclear and Energy Research [IPEN], as is described in an article on this page. The institute's facilities are located within the Sao Paulo University campus, in Sao Paulo. It is believed that the

nuclear fusion research is being carried out by the Air Force Technological Center (in its Advanced Research Institute, IEAV) in Sao Jose dos Campos. Nonstaff are not allowed to enter either of these two institutes. Only the people in charge of the program have access to the areas where the research is being undertaken.

Rex Nazare, 47, the president of the National Nuclear Energy Commission, CNEN, has refused to allow FOLHA reporters into the IPEN facilities, "unless he was told what was to be published." IPEN is under CNEN jurisdiction. Nazare refused to reveal the progress of the Brazilian nuclear research, claiming that it involves "industrial secrets."

He said that wealthy countries (particularly the United States and the USSR) usually spy and try to sabotage the programs of the countries which move ahead by themselves. He cited several cases of scientists and high-level technicians who have been offered salaries of up to four times their current salaries to abandon some projects, for the sole purpose of delaying the program.

Nazare remarked that the Brazilian nuclear research has peaceful purposes and pointed out that the industrialized countries' refusal to provide enriched uranium, "even for laboratory experiments," has forced the country to undertake its own independent program.

In an attempt to deny any intention of using the nuclear research for military purposes, Nazare spoke about money: "Compared with the industrialized countries' budgets, ours is insignificant. The CNEN budget does not reach 100 billion cruzeiros, while in the 1940's, the United States spent \$2 billion (at 1940 rates) on its nuclear project." The CNEN president added that the institution "has openly reported the research data and the fields of application." Asked when Brazil will develop the complete nuclear fuel cycle technology, Nazare, a physicist and nuclear engineer with a PhD from France's Sorbonne University, replied: "Apples had fallen to the ground for millions of years before Newton observed the phenomenon and concluded that apples fall because they are pulled by some agent, the law of gravity. This is the way these things happen, they are discovered by chance."

During an interview at the Aeronautics Club in Rio de Janeiro, of which he is president, General Waldyr Vasconcelos, 60, former Armed Forces Joint Staff (EMFA) chief said that "a country that wants to grow and that can grow because of its large territory and its great potential, must skip stages by investing in science and technology in order to preserve its sovereignty." On 10 December 1983, when he was EMFA chief, Vasconcelos told the newspaper O GLOBO that "any nation that wants to develop must carry out this (nuclear) research, and whoever develops the nuclear technology can build even a bomb. But the building of a nuclear bomb depends on a political, not a technical or scientific decision." He has stressed to FOLHA that "the political decision to build a bomb has not been made yet." Vasconcelos reiterated that the Brazilian nuclear program has peaceful purposes and recalled that the nuclear accord with the FRG was agreed upon "in the 1970's, when the Brazilian annual growth rate, which was 10 to 12 percent, gave rise to fears that hydroelectric energy might not be sufficient for the future."

This statement has been denied by a former military minister, who said that the nuclear agreement with the FRG was a pretext to allow Brazil to acquire uranium enrichment know-how.

CSO: 5100/2097

BRAZIL

MUTUAL INSPECTION AGREEMENT WITH ARGENTINA REPORTED

Itamaraty Noncommittal

Rio de Janeiro O GLOBO in Portuguese 29 Mar 85 p 26

[Text] Minister Renato Prado Guimaraes, spokesman for Itamaraty stated that thus far, nothing is concrete regarding a possible accord for the mutual inspection of nuclear plants between Argentina and Brazil.

According to Prado Guimaraes, the matter was raised by Argentinian President Raul Alfonsin during a press conference 2 weeks ago in Buenos Aires prior to his visit to Brazil to take part in the presidential swearing-in ceremonies. At the time, Alfonsin suggested that a meeting between the Latin American heads of state be held to discuss, among other things, the possibility of a regional safety agreement in the area of non-military nuclear power.

Minister Prado Guimaraes stated meanwhile that there is no on-going study being done on this matter in Brazil at the present time.

Prado Guimaraes added that the matter could be considered once the proposal has been submitted.

Newspaper Praises Agreement

Rio de Janeiro O GLOBO in Portuguese 29 Mar 85 p 26

[Article by Edgardo Costa Reis]

[Text] Brazil and Argentina have reportedly agreed in principle to open their nuclear plants for mutual inspection. The plan, revealed in an American magazine specializing in nuclear subject matter was praised in Congress and in an editorial yesterday in the influential newspaper THE WASHINGTON POST as an important step for peace and nuclear arms control in the hemisphere.

According to NUCLEONICS WEEK, a McGraw-Hill publication, the decision to negotiate the future access to nuclear plants in the other country was made by President-elect Tancredo Neves during his visit to Buenos Aires last February.

According to the publication, the alleged agreement, suggested by Argentina and a surprise to many diplomatic observers, would include the inspection of all nuclear plants in both countries, including those based on national technology, and would greatly broaden the existing relations covered in the cooperation agreement between the 2 countries dated 17 May 1980.

Citing Argentine authorities, Richard Kessler, NUCLEONICS WEEK correspondent in Buenos Aires, said that Alfonsin and Neves do not intend to substitute or minimize the role of safeguarding held by the International Agency of Atomic Energy.

The accord brought the expected reaction from Congress and the American press. In a letter to other congressmen during President Raul Alfonsin's visit to Washington last week, Senators John Glenn and Dan Quayle stated that the initiative should be applauded as "a giant step in the direction of safeguarded peace that all the Americas seek".

12402

CSO: 5100/2089

BRAZIL

GOVERNMENT TO RENEGOTIATE FRG NUCLEAR AGREEMENTS

PY101518 Sao Paulo O ESTADO DE SAO PAULO in Portuguese 9 Apr 85 p 36

[Excerpt] The government intends to renegotiate the nuclear agreement between Brazil and the FRG during the second half of this year, according to information provided by Mines and Energy Minister Aureliano Chaves. By early October, Minister Chaves will receive from his advisers a detailed study on the consumption of electric energy, including a concrete proposal for reviewing the aforementioned agreement. This study is to be presented to the nation's president as well as to the foreign minister.

As he anticipated yesterday after meeting with Acting President Jose Sarney, Minister Chaves' initial idea is to put the Angra I nuclear plant in operation, to complete construction of the Angra II nuclear plant, to begin construction of the Angra III nuclear plant, and "to rethink the use of nuclear energy in Brazil." The minister said: "Brazil needs to harness the technology of the atom for energy generation, but it also needs to bring this effort into line with its financial resources and its more urgent priorities, such as fighting poverty."

CSO: 5100/2087

BRAZIL

NAVY REPORTEDLY MANUFACTURING NUCLEAR REACTORS

PY292325 Sao Paulo FOLHA DE SAO PAULO in Portuguese 28 Apr 85 p 25

[Text] The Navy is conducting a parallel nuclear research program at the Institute for Nuclear and Energy Research (IPEN) which is on the Sao Paulo University campus.

The program is being conducted in such secrecy that even IPEN scientists are not informed unless they are directly engaged in the research. Many of the researchers have specific tasks to fulfill and know nothing about the preceding stages or those that follow their work. The Navy, which is ensuring the secrecy of the research, has been in charge of the IPEN program since November 1982. In principle, the research is aimed at building a nuclear reactor to be used in a submarine.

Captain Othon Pinheiro is the general chief of the Coordinating Board of Special Projects (Copesp). He is in charge of a critical unit of the project, a zero-power reactor designed for research purposes and to test the nucleonics (behavior of neutrons) of the power reactor to be used in the submarine.

Projections show that the reactor, which is of the Pressurized Water Reactor (PWR) type, will be a 38 to 40 MW power reactor, operating with Uranium U-235 (fissionable) enriched to between 4.2 and 4.8 percent. The prototype of the reactor will be ready "on land" between 1990 and 1992.

The other project, called "Cyclone," is also considered most important and falls under the responsibility of Commander Fernando Barros. It has to do with uranium enrichment through the jet nozzle process [ultra-centrifugacao]. The sub-projects of this area are designed for uranium processing.

The first sub-project is the Conversion Project [Procon]. This research consists of converting uranium dioxide (UO₃), which is supplied to IPEN by certain countries and by the Pocos de Caldas deposits, into uranium hexafluoride (UF₆). This gas is used to enrich the uranium, which will be converted into UF₄. The metallic uranium, which is obtained from the UF₄, is used as fuel for the fast-breeder reactor (reactor plutonigeno) which does not serve to produce energy but only to produce plutonium. This reactor (zero-power reactor), which will use graphite as a coolant, has zero-power and is, therefore, called a critical reactor. Nonetheless, it represents an important step toward achieving within a few years a reactor capable of producing more plutonium, which has nothing to do with the generation of energy but which is an option for the manufacture of bombs.

In the chemical field, the project foresees the purification of UF_6 or UF_4 to obtain DUA (diuranate ammonia), also known as "yellow cake" [preceding two words in English], a processed natural uranium, or TKU (tricarboxylate of uranyl ammonia). The following step is the calcination (burning) of the U_3O_8 of that substance to obtain the fuel for research reactors.

Of these reactors developed by IPEN, one is at the Federal University of Pernambuco and another at the Military Engineering Institute in Rio de Janeiro.

In the ceramics department of the metallurgical sector, IPEN is working on the manufacture of the fuel element (enriched uranium pellets in their recipients) and on the reprocessing of that fuel, the installation of which is based on the FRC method. These projects are being financed by the National Security Council and by the Navy. The resources are transferred to IPEN through the Naval Commission in Sao Paulo.

Owing to the dual administration of the institution, by the Navy and by the Sao Paulo State Government, two categories of officials exist within IPEN: those involved in the military projects and the other researchers. The scientists who work with the military receive two salaries, one from IPEN and the other "from outside."

CSO: 5100/2099

BRAZIL

ARCHER SEEKS TRANSFER OF CNEN TO S & T MINISTRY

Sao Paulo FOLHA DE SAO PAULO in Portuguese 26 Mar 85 p 26

[Text] At a meeting with scientists and researchers from all parts of the country, Science and Technology Minister Renato Archer, 62 years of age, indicated yesterday in Sao Paulo that the National Council for Nuclear Energy (CNEN), now under the control of the Ministry of Mines and Energy, may be transferred to his ministry. This assertion, later confirmed in an interview, was made during a 3-hour discussion between the minister and 60 of the country's scientific companies; the meeting was arranged and coordinated by the Brazilian Society for the Advancement of Science (SBPC).

According to Renato Archer, both the CNEN and the Secretariat of Industrial Technology [STI], the latter associated with the Ministry of Industry and Commerce, can change office without problems. "There is a decree, issued in 1967, which authorizes the government to establish the Ministry of Science and Technology and include the CNEN in that ministerial office." The minister went on to explain that President Tancredo Neves used this decree as a basis for establishing the new ministry and that the inclusion of the CNEN and STI depends only on an understanding with the president, not possible until now because of his illness.

The Brazilian nuclear program in all its aspects has been of constant concern to the scientific community, held back until now by an abundance of discussion. Therefore, no one was surprised yesterday at the number of times that this issue was raised. And the scientists present at the meeting in the auditorium of the Amparo Research Foundation of Sao Paulo State (FAPESP) voiced their concern over seeing the CNEN, an organization of supervisory nature, linked to the same ministry with which NUCLEBRAS [Brazilian Nuclear Corporations, Inc.] is associated, in case the organization is controlled.

Greater Participation

The lack of appropriations for scientific research is a chronic problem in Brazil, grown appreciably worse in recent years. This reality was also brought to the attention of Minister Renato Archer, not in the form of information but as an appeal for an urgent plan to aid the research sector which is in a state of extreme penury. The facts reported during the discussions leave no doubt: laboratories, libraries and museums without investments for 15 years; research

institutions without funds to pay their research personnel; a lack of resources for certain types of manufacture in Brazil making it necessary to import vaccines against poliomyelitis, "triplice" [presumably DPT] and antitetanus serum, all of this resulting in the configuration "of a barren land," as it was termed by physicist Moyses Nussenzveig.

Criticism was also heaped on previous administrations and on the orientation given to research by the federal financial organizations, the National Council for Scientific and Technological Development (CNPQ) which, in February, had almost no funds with which to pay its fellowship holders, and the Funding Authority for Studies and Projects (FINEP).

After 3 hours of discussion, the situation became very clear: the scientists want to be heard and have the right to participate and vote on the guidelines incorporated in the policy of the science and technology sector. SBPC President Crodowaldo Pavan, 65 years of age, asserted that in principle there was no consensus in the scientific community on the establishment of the new ministry but that, once it is established, he intends to let no opportunity escape to play an active and influential role in both its policy-making and project activities and in the allocation of funds.

"We hope that this is just the first of a series of meetings between the minister and the scientific community and we request that in the establishment of the ministry room be left for a deliberative council with the participation of the scientific community."

Renato Archer left the meeting saying that he was pleased and that he considered the discussion "useful in giving a true picture of the reality of the research institutions in Brazil." He proclaimed the government's interest in investing in new areas such as genetic engineering, biotechnology, precision mechanics and others. He disclosed that he had already had a meeting with Treasury Minister Francisco Dornelles "to advise him about the seriousness of the situation in the scientific area" and concluded the meeting saying that "he was certain that the ministry will be strong."

8568

CSO: 5100/2086

BRIEFS

NUCLEBRAS BUDGET CUT FEARED--In case the budget for NUCLEBRAS, estimated at \$800 million this year, were to suffer cuts, following the new policy of containing public expenditures, the difficulties in meeting its administrative costs (payroll, social responsibilities and rentals) will increase. These expenses have been covered by funds borrowed overseas. According to Wenceslau Magalhaes, Finance Director, the reduction would have a "drastic effect". Without cash reserves, Nuclebras has no way of paying the overdue debt with contractors and suppliers, estimated at 70 billion cruzeiros. The director explained that since the corporation does not generate income, it should receive 324 billion cruzeiros from the state during the year. However, its administrative expenses are more than 400 billion cruzeiros. Thus, of the \$500 million that will be borrowed overseas, \$100 million will be used to cover this difference. [Text] [Rio de Janeiro O GLOBO in Portuguese 19 Mar 85 p 19] 12402

1984 NUCLEBRAS LOSSES--NUCLEBRAS had losses totaling 142.7 billion cruzeiros last year, the equivalent of 4.30 cruzeiros loss per share. In 1983, losses totalled 108.1 billion cruzeiros. The corporation was affected by the payment of financial charges that increased from 233 billion cruzeiros to 3,400 billion cruzeiros. In 1983, NUCLEBRAS did not have financial charges, which totaled 2,900 billion cruzeiros in 1984. With this, the liquid financial disbursement reached 537.3 billion cruzeiros last year. The monetary correction balance was positive by 522 billion cruzeiros. The consolidated balance of NUCLEBRAS showed losses of 138.8 billion cruzeiros, compared to 168.2 billion in 1983. The liquid income increased from 65.3 billion cruzeiros to 190.1 billion cruzeiros. The credit balance of monetary correction went from 58.6 billion cruzeiros to 959.9 billion cruzeiros. NUCLEBRAS and its subsidiaries appropriated 2.7 billion cruzeiros for Nucleos, a pension fund for its workers. [Text] [Rio de Janeiro O GLOBO in Portuguese 16 Mar 85 p 24] 12402

POSSIBLE NUCLEBRAS PRESIDENT--Paulo Belotti, financial director of PETROBRAS [Brazilian Petroleum Corporation], is almost certain to become president of NUCLEBRAS [Brazilian Nuclear Corporations, Inc.], and Jose Israel Vargas, former secretary of industrial technology at the Ministry of Industry and Commerce, who until last week had been considered the definite choice to direct that enterprise, will be transferred to the chairmanship of the National Commission for Nuclear Energy (CNEN), according to sources from the Ministry of Mines and Energy as reported by GLOBO AGENCY. Acre Governor Nabor Junior learned yesterday from the minister of mines and energy that Petro Monteiro de Medeiros was to be considered for one of the five directorships of ELETRONORTE [Northern Electric Power Plants]. According to Nabor Junior, Aureliano promised to consider this possibility. [Text] [Sao Paulo GAZETA MERCANTIL in Portuguese 26 Mar 85 p 11] 8568

BANGLADESH

BRIEFS

COMPUTER FOR AEC--The largest computer installed at Savar by Bangladesh Atomic Energy Commission (BAEC) will go into operation from the first week of May '85. Procured at a cost of Tk two and a half crore the computer will help solve various problems in the fields of policy formulation, administration, preparation of pay bill and budget, manpower planning, making inventories, data processing and preparation of report etc. A BAEC source told ENA Saturday this will provide cent percent reliability of all kinds of information. The computer, which is being manned by local experts has been supplied by the International Business Machine (IBM) a world trade corporation of the USA. It requires 66 employees including 20 officers, to man it. The BAEC has installed a fire extinguisher to protect the computer from the outbreak of fire. The BAEC source said the computer will help save amount of foreign exchange being sent by different ministries like education, population, health, etc by referring their problems to commercial computer companies abroad. It may be noted that the BAEC installed the first computer in the country in 1964. [Text] [Dhaka THE NEW NATION in English 2 Apr 85 p 3]

CSO: 5150/0013

INDIA

BUDGET FOR NUCLEAR DEVELOPMENT REVIEWED

Madras THE HINDU in English 18 Mar 85 p 9

[Text]

NEW DELHI, March 17.

The budget for 1985-86 has made a provision of Rs. 429.30 crores for nuclear power schemes against Rs. 285.81 crores under the revised estimates for 1984-85, which are substantially lower than the original budget provision of Rs. 326.74 crores.

The fall in the revised estimates is mainly due to the postponement of procurement of fuel for the Tarapur atomic power station (Rs. 42.16 crores), but this is partially counter-balanced by increased provisions for operational expenses of the Rajasthan atomic power station (Rs. 4.67 crores) and the Madras atomic power station (Rs. 3.13 crores).

The higher provision in the current budget is attributed mainly to the procurement of fuel for Tarapur and its fabrication (Rs. 44.78 crores), operational expenses of the Rajasthan station (Rs. 12.14 crores) and the Madras station (Rs. 8.68 crores), and heavy water pool management (Rs. 8.70 crores).

A saving of Rs. 10 crores in the capital section, the revised estimates for 1984-85 show a saving of Rs. 10.22 crores following the reduced requirements of the Rajasthan station (Rs. 8.88 crores), the Narora project in U.P. (Rs. 8.55 crores) and the advanced procurement of material and equipment (Rs. 7.39 crores). This reduction has been partially counterbalanced by the increased requirements of the Kakrapur atomic power project in Gujarat (Rs. 15.16 crores).

The increase of Rs. 68 crores in the capital budget for 1985-86 is on account of a larger provision for the Kakrapur project (Rs. 19.75 crores), the two units of the Rajasthan station (Rs. 3.83 crores), the Madras station (Rs. 6.31 crores), the sixth and seventh atomic power stations (Rs. 6 crores), development works for 500 MWE (Rs. 4.41 crores), etc.

Provision for DAE: The total budget provision for the Department of Atomic Energy (DAE) is Rs. 1075.43 crores, of which Rs. 644.78 crores is for atomic research, development and industrial projects.

The outlays under atomic research and industrial projects include Rs. 65.17 crores for capital projects of the Bhabha Atomic Research Centre and Rs. 82.67 crores for the operational activities of various research and development divisions, laboratories and other plants of BARC.

The capital projects for which provisions have been made include the research reactor (Dhruva), and a modern computer system at Trombay. A power reactor fuel reprocessing plant is being set up at Kalpakkam near Madras, for which the provision is Rs. 32 crores. Another provision of Rs. 8.83 crores for revenue expenditure has been made for the reactor research centre at Kalpakkam.

For the nuclear fuel complex in Hyderabad the budget provides Rs. 3.68 crores on the capital account and Rs. 57.70 crores for running expenses.

A provision of Rs. 147.30 crores has been made to meet the capital expenditure of the heavy water plants at Kota, Talcher, Thal-Vaishet and Manuguru for producing heavy water needed by atomic power stations.

The heavy water plants at Kota, Baroda, Tuticorin, Talcher, Thal-Vaishet and Manuguru are designed to produce 100 tonnes, 67.2 tonnes, 71.3 tonnes, 62.7 tonnes, 142 tonnes and 200 tonnes of heavy water respectively. The Tuticorin and Baroda plants have already become operational and the Talcher and Kota plants are expected to be operational in 1985-86.

A provision of Rs. 184.5 crores for procuring heavy water required to meet the operational needs of the nuclear power stations has been made.

CSO: 5150/0011

INDIA

OFFICIAL TELLS PLANS TO MEET NUCLEAR POWER TARGET

Calcutta THE TELEGRAPH in English 25 Mar 85 p 6

[Text] Bangalore, March 24 (PTI, UNI):

The department of atomic energy has taken up construction of heavy water plants, opening up of new uranium mines and augmentation of nuclear fuel facilities to meet the goal of generating 10,000 MW of nuclear power by 2000 AD, Dr M.R. Srinivasan, chairman of the Nuclear Power Board, said today.

The department was also proposing to build a 500 MW prototype fast breeder reactor (FBR), which would follow commissioning of the Kalpakkam FBR at Madras later this year, Dr Srinivasan said while delivering a state-of-the-art lecture on "Relevance of nuclear energy" at the Central Power Research Institute (CPRI).

He said the 500 MW FBR was expected to go into operation in the mid-90s and would serve as a prototype for a number of such

reactors to be built in the early years of the next century.

He added that the proposed 22 reactors to be built in the next 15 years would be set up to standardised designs and in a cluster of four reactors at a given site. Specific designs would be prepared for foundations, condenser cooling and transmission lines and increasing use of computers would be allowed.

Dr Srinivasan said standardised designs, proven components and mechanised construction could reduce the gestation periods for the nuclear reactors, which at present, was about eight years.

Dr Srinivasan said nuclear power was emerging as a competitive, economic and viable source of power in future in the light of the limited coal, oil and gas reserves.

On the other hand, with the currently known uranium reserves, an ultimate capacity of 350,000 MW of nuclear power could be attained by the later half of the next century using heavy water reactors followed by fast breeder reactors. The programme could further be sustained at a higher level of operation.

He said the heavy water plants at Baroda and Tuticorin had begun to function in a reliable manner and work on the other two plants at Thal-Vaishet in Maharashtra and Amnugundu in Andhra Pradesh had also been initiated.

He said there was no need for installation of reactors in the north-eastern region as it was rich in hydel power generation. However, a nuclear research centre would be established in that region.

CSO: 5150/0009

INDIA

AEC CHAIRMAN TELLS PLANS TO USE MIXED FUEL

Calcutta THE SUNDAY STATESMAN in English 10 Mar 85 p 7

[Text]

BOMBAY, March 9.—India will be the first country in the world to use mixed uranium-plutonium carbide fuel for a nuclear reactor when the fast breeder test reactor at the reactor research centre at Kalpakkam near Madras is commissioned during the current year.

The reference fuel for other similar demonstration fast breeder reactors elsewhere is mixed uranium-plutonium oxide containing highly enriched uranium. The manufacture of the new FBTR fuel from totally indigenous sources has established the country's success in achieving self-reliance in such a sophisticated and front-line nuclear technology.

This information was given by Dr Raja Ramanna, Chairman of the Atomic Energy Commission, at a Press conference here yesterday. The development of this fuel has saved the country a considerable amount of foreign exchange.

India will be the first country to gain highly valuable full-core operating experience with this advanced fuel. Dr Ramanna said the exercise of indigenous fuel fabrication had created confidence in the country's venturing in the manufacture of fuel for the future larger prototype fast reactor, PFBR-500.

The decision to fabricate the FBTR fuel indigenously was taken almost simultaneously with the decision to take up the construction of the Kalpakkam reactor. This was based on the confidence generated by the successful manu-

facture of the complete core of the plutonium oxide fuel elements for the "Purnima" fast reactor at the radiometallurgy division of BARC in Bombay.

It was decided in 1973 to use mixed uranium-plutonium oxide fuel for FBTR using 85% enriched uranium from abroad. A new mixed oxide fuel manufacturing facility was set up at Trombay and it was commissioned between 1973 and 1977.

Studies on the feasibility of using uranium-plutonium monocarbide for the FBTR were initiated in 1977. On the basis of the encouraging results from the study, a decision was taken in 1978 to modify the facilities for the fabrication of mixed oxide fuel so that it could fabricate the advanced mixed uranium-plutonium carbide fuels. The modified facility manufacturing carbide mixed fuel was commissioned in 1983.

The fabrication of the whole core is now nearing completion. More than two-thirds of the fuel pins have been transported to Kalpakkam in specially-designed bird cages. The transport containers have been extensively tested to meet several accident criteria, according to specifications stipulated by the International Atomic Energy Agency. The bird cages, containing significant quantities of plutonium, were carried to the site in a special vehicle designed and manufactured by the BARC.

CSO: 0150/0007

INDIA

AEC CHAIRMAN INAUGURATES BOMBAY MEETING

New Delhi PATRIOT in English 2 Apr 85 p 8

[Text]

Bombay, April 1 (UNI)—Atomic Energy Commission chairman Raja Ramanna today said that fast breeder nuclear reactors were far cheaper as they produced more fuel than they burnt.

Inaugurating a four-day Indo-French seminar on nuclear energy here, Dr Ramanna said nuclear generation was well suited to India as it was cheaper than thermal energy even at the pit head stage.

He said a few reactors would be going critical soon and expressed confidence that the Indian industry would gear itself to build the components for the further generation of nuclear reactors.

Dr Vendryes, a senior French nuclear scientist, in his remarks, said India and France were among the first to build nuclear cooperation for peaceful purposes. But that process had got diminished and came to a full halt.

He said there were differences in the types of nuclear technology obtaining in the two countries but both had a similar policy on nuclear uses. This called for further cooperation.

Dr Vendryes said France had realised the importance of fast breeder reactors in 1960 when there was talk on the shortage of uranium fuel. These reactors, which produce more fuel than they burn up, would form a major part of this country's future nuclear power programmes.

France, which has a 233 mw fast reactor functioning successfully since 1973 and a 1200 mw FBR in the final stage of commissioning, is now planning for a 1500 mw unit of this type.

Participating in the seminar, Nuclear Power Board Chairman M R Srinivasan said the success of the 10,000 mwe nuclear power pro-

gramme required much greater attention of the industry.

The concept of bulk ordering, as in France, was being adopted to provide continuity of orders for a series of components for the next six reactors.

The capital on the programme, though large, was only a fraction of the investment needed for attaining a target of 150,000 mwe by the end of the century, he said.

Dr Srinivasan said with the establishment of 10,000 mw nuclear capacity based on natural uranium resources, adequate plutonium would be produced annually making it possible to add 1,000 mw of fast breeder reactors every year.

This plutonium, together with the uranium 238 left over from the 10,000 mwe programme, would enable putting up 350,000 mwe of fast breeder reactors in the next century.

"This is the target set for our fast reactor programme", he said in a special paper.

He said that as a second phase, the Indo-French 15 mwe fast breeder test reactor was nearing completion at the separate research centre at Kalpakkam.

Dr Srinivasan said the experience generated at Kalpakkam had encouraged Indian scientists to prepare a feasibility report for a 500 mwe prototype fast breeder reactor while takeup supporting activities like fuel fabrication and spent fuel reprocessing.

A facility for manufacturing plutonium fuel elements for the fast breeder reactor had been set up at Trombay. The plutonium-uranium carbide fuel elements needed for start up of the reactor had already been fabricated, along with thorium oxide fuel elements for placing in the blanket.

INDIA

PLANS TO BUILD NUCLEAR PLANT IN BENGAL TOLD

Calcutta THE SUNDAY STATESMAN in English 10 Mar 85 p 11

[Article by S. R. Chakrabarti]

[Text]

It was probably the Bengal National Chamber of Commerce and Industry which first voiced the need for installing a nuclear power plant in West Bengal after the first such plant began operating successfully in Tarapur. If things moved in the Chamber's way, Danton in Midnapore would long ago have become a significant point on the country's nuclear power map.

The Chamber was, however, given to understand that as a matter of policy no nuclear power station would be installed within a radius of 150 km from the coal base. Thermal power stations would be the answer to power problems in these areas.

In course of time, two other nuclear power stations were built, one at Renukagar in Rajasthan and the other at Kalapakkam in Tamil Nadu. In addition to these three, four more are currently under construction—one more at Kalapakkam, two at Narora in U.P. and one at Kakrapur in Gujarat—each with a capacity of 233 MW.

According to Dr M. R. Srinivasan, Chairman of the Nuclear Power Board, there is a proposal to build 10 to 12 reactors more of 500 MW each in the next 15 years. Work has already been initiated on two heavy water plants—one at Thal Valsbet in Maharashtra and the other at Manugura in Andhra Pradesh to meet the needs of the reactor programme. Earlier, Dr Raja Ramanna, Chairman of the Atomic Energy Commission, had announced that four of these reactors were proposed to be built during the Seventh Plan.

It is clear from Dr Ramanna's statements that technological considerations would be given priority in the selection of sites for the reactors. But it appears that politico-economic considerations have prevailed and West Bengal has once again returned to

the picture. In fact, as an Atomic Energy Commission official has clarified, this was because "it was the personal wish of the late Prime Minister, Mrs Indira Gandhi, to locate the first atomic power plant of the eastern region in West Bengal".

VISIT BY EXPERTS

Last April, the AEC sent its experts to visit Danton. Again, the location was rejected as being unsuitable for the purpose. The Commission, however, asked the State Government to suggest an alternative site. After much procrastination, the West Bengal State Electricity Board suggested the Kedirabad Char in Midnapore district but not before it had put forward the claims of a location in Murshidabad district, knowing full well that it would be rejected because in case a disaster occurred it would pollute not only land in India but also in Bangladesh. Moreover, there was a strong possibility of the entire downstream flow of the Bhagirathi, being polluted.

According to the AEC, water availability is an important consideration for such a project. If the plant uses seawater for cooling, a 2000 MW plant would require 4,000 cusecs of water of which, about 2,400 cusecs would be retained in the process and the rest drained off into the sea. With sweet water, in requirement and utilization both would be reduced to a tenth of the above quantum.

The project would also require

an area of about 13 sq km, or, an area with a radius of 1.5 km from the centre of the plant. A radius of 5 km would be considered strategic. The area also had to be sparsely populated so that people could be easily evacuated if the need arose. The power plant had to have a considerable local base load. The WBSEB has indicated that the present demand in Midnapore District is highly suppressed and that there should therefore be plenty of load by the time the power plant became operational.

The AEC's objections, one understands, are based on technological considerations. But why should the State Planning Board be against the project? The Board has now reportedly come up with a bagful of reasons against the setting up of a nuclear plant. According to it, a nuclear plant will not generate employment commensurate with the cost involved. In comparison, an equally costly thermal plant would employ a far larger number of people. Secondly, the State Government would have little say in the project. Thirdly, the power derived from the plant might have to be shared with neighbouring States, and sharing is always attended by trouble, a case in point being the DVC. A fourth objection is a fall-out of the Bhopal incident.

LITTLE BASIS

All these are of course specious arguments. To take the feared radiological pollution of the environment, it has been found that the total impact of nuclear energy has registered "a trend of consistent decrease in terms of dosage to the public per unit of energy produced". The International Atomic Energy Agency has reportedly indicated that the total radiological impact on the public from nuclear power production for the past 30 years corresponds to less than a day's exposure to radiation from natural sources. It should also be appreciated that a Rs 3,000-crore nuclear project would generate a number of ancillary units and, as AEC sources have indicated, at least a third of the amount may be spent in the State. A third again may be spent in the region concerned itself.

INDIA

BRIEFS

PARLIAMENT ON NUCLEAR OPTIONS--In the Lok Sabha today, several members urged the government to keep its nuclear options open in view of the reports of Pakistan going in for nuclear weapons. Taking part in the resumed discussion on budgetary demands of the Defense Ministry, they particularly stressed the need to strengthen the naval force for which, they said, sufficient funds have not been allocated. They also said that further steps are needed to modernize the Air Force. Drawing attention to the acquisition of sophisticated weapons by Pakistan and the situation in Sri Lanka, they said every effort has to be made to step up our defense preparedness. The increased military presence of the United States in the Indian Ocean, the Afghanistan problem and the Gulf war are the other grave factors responsible for escalation of tension in the region, and the government will have to view them with serious concern. [Text] [Delhi General Overseas Service in English 1330 GMT 25 Apr 85]

SMUGGLING OF URANIUM DENIED--The government today denied the reports of smuggling of uranium from India to Pakistan through Nepal. The minister of state for finance told the Lok Sabha, in reply to a question, that the reports received by government do not indicate any such smuggling. [Text] [Delhi Domestic Service in English 0730 GMT 26 Apr 85]

MADRAS PLANT RESUMES OPERATION--The 235-megawatt Madras atomic power plant at Kalpakkam has resumed generation and is producing 115-megawatt power since last evening. It was shut down on the 21st of this month [as heard] due to blocking of the cooling tunnel. [Text] [Delhi Domestic Service in English 0240 GMT 1 May 85]

POWER STATION REPAIR--The Madras atomic power station at Kalpakkam has been shut down since Sunday because of some damage to the water (?screens) in the cooling system. The unit is expected to resume operation in about a week or 10 days after repairs. [Text] [Delhi Domestic Service in English 1530 GMT 23 Apr 85]

BARC TECHNOLOGIES--BOMBAY, March 16--The isotope division of the Bhabha Atomic Research Centre has developed a technique for ascertaining the quantity of mercury in circulation in electrolytic cells. This technique will be useful in caustic soda plants where periodic inventory of mercury should be taken to minimise losses as even in a medium-sized plant, the cost of mercury worked out at Rs. 5 crores. BARC has been providing such inventory service throughout the country so far. The new technology has now been transferred to Radio Tracer Services, Bombay. The technology transfer group of the BARC, which worked out the transfer details, signed an agreement with the firm here today. The isotope group will supply the required radiotracer (labelled mercury) while the equipment for radioactivity measurement will be provided by the ECIL. All other instruments and materials needed for this purpose are available indigenously. Among other technologies which are ready for transfer from the BARC are: diffusion pump oil, surface area analyser, ship-borne desalination plant, electrolyser for hydrogen and oxygen, reverse osmosis, X-ray diffraction power supply, field kit for measuring molybdenum in steel, zirconium oxide and bilirubin strips for detecting jaundice. [Text] [Bombay THE TIMES OF INDIA in English 17 Mar 85 p 9]

CSO: 5150/0012

PAKISTAN

COMMENTARY ON TYING U.S. AID TO NUCLEAR PROGRAM

GF171414 Karachi JASARAT in Urdu 6 Apr 85 p 3

[Editorial: "What Friendship Is This?"]

[Text] The Foreign Affairs Committee of the U.S. Congress has imposed a restriction on military and economic aid to Pakistan. This decision was reached while approving the 1985-86 budget for foreign aid for the U.S. fiscal year that begins 1 October. However this restriction will be temporary and President Reagan has been asked to approve aid after certifying that Pakistan has no atomic weaponry. If President Reagan certifies this, Pakistan will get \$130 million in U.S. aid.

Whenever there has been a question of supplying U.S. aid for Pakistan this dispute has been revived. In fact such discussions take place every year and then the matter goes before the U.S. Congress. Whenever the issue of aid comes into view threats to stop aid to Pakistan are very much in vogue. The no's argue that Pakistan has the bomb or is about to make one. It seems the main purpose served by such threats is to humiliate Pakistan and magnify its dependence. What is more, Pakistan is obliged to take these slights because as our former ruler had said, "beggars can't be choosers."

We are aware that the moratorium would be temporary and would not affect the flow of U.S. aid. However, the Foreign Affairs Committee has asked the U.S. President to certify that Pakistan does not have the bomb before aid is sent.

This deliberation, however formal it may be, has a regrettable aspect. On the one hand the United States claims to be a friend of Pakistan while on the other it behaves like a master. By imposing such occasional restrictions, the United States wants to please opponents of Pakistan's atomic program by making continued noises. The idea is to silence those countries who claim that Pakistan has made the bomb. The United States wants to show that it gives aid only after proper scrutiny whether the receiving country is busy making a bomb or not.

But, can this artificial gimmick by the United States silence such opponents? These people who despite repeated assurances by Pakistan still seem unsatisfied can be hardly expected to bite the hook. For example the Indian prime minister, Rajiv Gandhi, only recently told the *FINANCIAL TIMES* that Pakistan has the atomic bomb. He also complained to the United States that it was regrettable that it is doing nothing to stop Pakistan from

acquiring the bomb. He said that India could trust the United States but the United States must clarify its policy toward Pakistan.

In the case of Israel, it has no doubts. It has stated that Pakistan has already acquired a nuclear capability.

The United States can neither ignore India nor Israel. India has made the trust of the United States conditional on U.S. treatment of Pakistan. It means that if the United States stops economic aid and the sale of arms to Pakistan, India can have better relations with the United States. This means that restrictions on Pakistan can be useful for purchasing the goodwill of India. However the end product of this game is that although India may never trust the United States, such deliberations can only create doubts in Pakistan about the sincerity of U.S. friendship.

This matter also reminds one of past U.S. behavior. If we compare the course of Pakistan-U.S. relations with Indian-Soviet relations over the years, we find that India has already conducted an atomic test. It is also collecting arms from other countries. Despite all this, the Soviet arms aid to India has never stopped. The Soviets are in fact supplying arms to India at cut rates. The Soviets have placed no restrictions on India in this matter. Compared to this, the United States, a friend of Pakistan, refuses to accept Pakistan's assurances that it is not making the bomb.

This attitude persists despite the fact that the United States has the best spy system in the world. There is hardly any country that has not been penetrated by the U.S. spy machinery or whose plans are not known to the U.S. Government.

Pakistan is after all a small country. Its intentions and plans are not secret to the United States. Then what kind of assurances and certificates does the U.S. Administration want to have? The U.S. Administration knows well the kind of geographical threat Pakistan is facing today. At this time Pakistan needs the greatest assurance from its friends. Under the circumstances any deliberations that may injure Pakistan's trust and reliance on the United States cannot be in order. The U.S. Administration must, in the words of Rajiv Gandhi, make its policy clear toward Pakistan.

CSO: 5100/4745

PAKISTAN

U.S. AID CURBS TIED TO NUCLEAR PROGRAM TERMED 'UNJUST'

GP101234 Rawalpindi PAKISTAN TIMES in English 5 Apr 85 1

[Editorial: "An Unkind Cut"]

[Text] The news from Washington that the U.S. Congress foreign policy panel too plans to impose curbs on aid to Pakistan on grounds of a certain nuclear capacity which we might have makes strange reading. Only a few days earlier a U.S. Senate panel had singled out Pakistan for a similar aid ineligibility. The provocation for all this is said to be the attempt by a private businessman of Pakistan to export Krytron switches from U.S. some time back. That such switches are used for many other kinds of machines and that the gentleman held responsible for it had no connection with the Pakistan Atomic Energy Commission or with any other government agency, have apparently not been found as good enough explanations.

Both the House and the Senate in U.S. are of course sovereign legislative bodies and free to make any laws that they deem proper, but what makes this particular situation so bizarre is that the conditions and curbs are meant only for Pakistan, supposedly a close friend, and do not apply to those countries which not only have much more advanced nuclear capacities but also are not that close — as for example, India. Had such a law been passed against Pakistan by a country like Israel or South Africa (both incidentally already in the nuclear club), the thing would have been understandable, because they have a grudge against us for raising our voice against the persecution of the Arabs and the blacks. But that it should have been sponsored and supported in the higest U.S. legislative bodies gives one that strangest of feelings that the law makers there are after all not as free in their deliberations as might be expected.

That the Zionists can get even a manifestly unjust measure passed in U.S. against a friend of U.S. speaks volumes for the vulnerability of U.S. foreign policy. And what makes it even more strange is the fact that the lobbies which are apparently so successful in the U.S. legislatures in doing down and mortifying a friendly country are not working in the interest of U.S. The masters that they obviously serve are elsewhere. That the case for Pakistan is not fully understood in U.S. goes without saying. That Pakistan cannot give up its nuclear research programme without committing a virtual suicide in regard to its energy development also perhaps needs to be explained more fully. The efforts made by our embassy in U.S. though commendable, need to be reinforced further. Even though the propaganda clout of the Zionists in U.S. cannot be matched and even though our sympathy for the cruelly victimised people of Palestine cannot be given up, the public there can still be told of the harm that is being done to U.S. interests abroad.

PAKISTAN

ATOMIC ENERGY CHAIRMAN TALKS ABOUT ENERGY GOALS, TECHNOLOGY

Karachi DAWN in English 26 Mar 85 p 2

[Text]

LAHORE, March 25: Describing technology as the common heritage of all mankind, the Chairman, Pakistan Atomic Energy Commission (PAEC), Mr. Munir Ahmed Khan, on Monday made a strong plea to waive of all restrictions on transfer of nuclear technology from industrialised countries to the developing ones. "A deliberate policy of denial of technology is bound to be misunderstood and may accentuate the already not-too-happy relationship between North and South, a situation which we all must try to avoid," he warned.

The PAEC Chairman was delivering his inaugural address at the 7th working group meeting of the Regional Cooperative agreement of the International Atomic Energy Agency (IAEA). The four-day meeting, held at the Institute of Nuclear Medicine and Oncology, Lahore (INMOL), is being attended by delegates of 10 countries while China is participating as an observer.

Mr. Munir Ahmed Khan said the developing countries are being forced to develop their own independent nuclear programme because of insecurity created by withholding supplies of necessary equipment by the industrialised states, and added, "this does not augur well for the future of nuclear power."

The PAEC Chairman expressed Pakistan's readiness to share its experience in the diverse peaceful uses of atomic energy with other developing countries. "Countries of the Third World must help themselves in the socio-economic development through greater South-South cooperation" he asserted.

Underlining the need for nuclear

energy he said it was of vital importance for developing countries, especially those short of fossil and hydropower resources. He said it was an established fact that nuclear plants of capacity of 600-1200 megawatts were more economical than equivalent fossil fuel fired plants using imported oil or coal.

He disclosed that Pakistan is planning to establish 5000 megawatts of nuclear capacity by the turn of the century including a 900 megawatts nuclear power plant to be commissioned by the early 1990s.

APP adds:

Mr Munir Ahmed Khan said that Pakistan had also been able to operate the Karachi Nuclear Plant and through its indigenous efforts nuclear fuel fabricated in Pakistan had achieved maximum design burn-up, and had met all the stringent control criteria while used in the Karachi plant, he added.

Mr Munir Ahmed Khan said that Pakistan believed in the peaceful utilisation of atomic energy with the sole objective of ensuring that its people could reap economic and technical benefits resulting from research and development in these areas.

He said that nuclear power plants under the vigilance of the International Atomic Energy Agency provided necessary assurance to the world community that these facilities were not used for non-peaceful purposes. The IAEA safeguard had worked reliably and had earned the respect of the international community.

Mr Munir Ahmed Khan said there were no restrictions on the transfer of oil, mineral and other

valuable resources from Third World nations to industrialised countries. There should likewise be no restrictions on the flow of nuclear technology for peaceful purposes in the other direction.

He said Pakistan was forced into a difficult situation regarding the Karachi Nuclear Power Plant due to unilateral cancellation of the agreement by the supplier state. In spite of this arbitrary cut off, Pakistan had continued to operate the Karachi Nuclear Plant through indigenous efforts. Pakistan's own fabricated fuel had achieved the maximum burn-up and had met all stringent quality control criteria.

He said Pakistan now hoped to build a larger 900 megawatts plant by early 1990s and establish about 5,000 megawatts of nuclear capacity by the turn of the century. If these plans materialised, nuclear power would meet about 25 per cent of electricity requirements by that time.

The PAEC Chairman said that on a world-wide basis, the most important impact of nuclear energy had been in the field of electric power generation. Nuclear power today accounted for about 12 per cent of the global electricity generation, and this was expected to increase to 20-25 per cent by the

end of this century.

In fact, nuclear power had already been meeting 40-50 per cent of electricity requirements in several West European countries. But, Asia-Pacific region have been rather slow in making use of this technology due to various constraints.

He emphasised that the use of nuclear power was of vital importance for energy starved developing countries. The established fact was that nuclear plants of capacity of 500-1300 mgw were more economical than equivalent fossil-fuel fired plants using oil or coal.

Mr Munir Ahmed Khan said that PAEC has been making peaceful use of atomic energy in agriculture at three centres located at different ecological zones. Likewise, PAEC has set up eight medical centres to provide diagnostic and treatment facilities to patients. The use of radiation and radioisotope techniques in industry was also pioneered by the commission.

Earlier, professor M. Zifferero, Deputy Director General, IAEA, while paying glowing tributes, eulogised the quality of scientific and technical activities of the PAEC and hoped for further progress in the peaceful uses of nuclear energy. —APP

PAKISTAN

NUCLEAR ENERGY AIMS REVIEWED, DEFENDED

GF091448 Karachi DAWN in English 7 Apr 85 p 7

[Excerpt] The statement of the Chairman of the Pakistan Atomic Energy Commission, Mr. Munir Ahmed last week that "Pakistan now hoped to build a larger 900 megawatt nuclear power plant by early 1990s" would, perhaps be widely interpreted as an expression of fervant optimism.

For plainly the odds against the plant coming on stream even 10 years hence are overwhelming.

Obviously, the chairman of the Pakistan Atomic Energy Commission (PAEC) had the projected Chashma Nuclear Power Plant (CHASHNUPP) in mind when he addressed the delegates from 10 countries attending the seventh working group meeting of the Regional Co-operative Agreement of the International Atomic Energy Agency (IAEA) at Lahore.

In his inaugural address, Mr. Munir Ahmed Khan, according to the news agency report, said that "Pakistan now hoped to build a larger 900 megawatt plant by early 1990s and establish about 5,000 megawatt of nuclear capacity by the turn of the century."

"If these plans materialised", Mr. Khan went on, "nuclear power would meet about 25 per cent of electricity requirements by that time."

No one in Pakistan, however, could possibly be more keenly aware of the difficulties of the task or the constraints shackling our efforts than the PAEC chairman.

Take, for instance, the 900 MW Chashma Nuclear Power Plant (CHASHNUPP) at Chashma in the Mianwali District of the Punjab, the sanction for which was accorded by the government of Pakistan three years ago. CHASHNUPP, unlike the Karachi Nuclear Power Plant (KANUPP), is to use light water reactor which requires enriched uranium. The KANUPP, it may be added, is heavy water moderated and uses natural uranium as fuel.

International tenders for Chashma were floated in 1983 and it was subsequently stated that the PAEC authorities were negotiating with several reactor suppliers in Europe.

Simultaneously, the American and the British press reported that all Western reactor suppliers in the informal suppliers' club, were

under heavy pressure from Washington to desist from providing any nuclear reactor, parts or equipment, to Pakistan.

In fact, presumably, the PAEC chairman had these reports in view when in the same address to the Lahore meeting he put in an eloquent plea for the waiving of all restrictions on the transfer of nuclear technology from the industrialised countries to the developing ones.

In fact, we have it on good authority that Pakistani nuclear scientists, attending seminars or symposia in the West, are often made to cool their heels in the anterooms while the rest of their colleague tour nuclear installations or plants.

Placed in a virtual academic quarantine as far as the pursuit of studies in nuclear science in the Western seats of learning are concerned, Pakistan was forced to establish its own courses of higher study and training at home. The Centre for Nuclear Studies at the Pakistan Institute of Nuclear Science and Technology (PINSTECH) in Rawalpindi, for instance, had to institute M.Sc (nuclear engineering) courses in such subjects as nuclear reactor safety, nuclear chemical plant design, radiation shielding, radioactive waste management, environment engineering, and computer programming.

Indeed, it is these locally-trained nuclear scientists, engineers and technicians — through what the PAEC chairman says, the policy of indigenisation — who have kept the Karachi Nuclear Power Plant (KANUPP) functioning, without undue interruption and mishap. There is, of course, a story behind it.

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Since then the 137-megawatts plant has been run and maintained entirely by Pakistani engineers, testifying to PAEC's determination to be self-reliant and be on its own.

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This meant that the station was 'on line' for almost eight months of the year, including a continuous run of 104 days as against a previous high of 75 days, when the Canadians were operating it.

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Not only did Pakistani engineers and technicians man the station, they also carried out several design modifications, in-service inspection and the maintenance of major equipment. They fabricated quite a few parts without any foreign help.

In fact, a pleasant surprise for newsmen who toured KANUPP was the display of a veritable "exhibition" of an astonishingly large range of parts, spares and equipment, either fabricated by the KANUPP itself or by other workshops and factories in Karachi, Lahore, Gujranwala and elsewhere.

Among the most notable achievements of the KANUPP technicians of course, is the manufacture of indigenous bundles of fuel used in the reactor.

Calling for a high degree of sophisticated expertise, the task was successfully accomplished, adding a new feather in the PAEC's cap.

As specialists at the station explained, the design specification of uranium oxide powder and pellets were carefully studied and optimized in accordance with the known requirements of the CANDU-type Canadian General Electric reactors.

Stringent quality control and quality assurance measures were imposed at each step in the manufacture of the fuel bundles. This was because no irradiation facilities were available.

Confident but still cautious, the scientists introduced the fuel bundles as a precaution first at the periphery of the reactor core where the neutron flux is minimal. As new grounds were broken and experience gained, the fuel was moved inwards. Currently, according to the station sources, indigenous fuel is used everywhere in the core.

Climaxing a scientific feat, early made-in-Pakistan nuclear fuel bundles have now achieved the maximum designed burn-up. This is no small achievement for a developing country with a narrow scientific base. The PAEC and its technical staff — there are several girls in the computer room — were thrown a challenge. They rose to meet it squarely.

Backed by extensive uranium exploration in northern Pakistan and mining at Lahore, the fabrication of safe and satisfactory fuel bundles for the nuclear power reactor has won for Pakistan the accolade of mastering the technology of the front-end of the nuclear fuel cycle.

In fact, in the words of a PAEC spokesman, Pakistan today has joined the small group of nations which explores and mines its own uranium, refines and upgrades it to the required specifications, fabricates it as fuel and finally burns it in a commercial power reactor to produce electricity.

It may here be added that the KANUPP operates under the full safeguards of the International Atomic Energy Agency (IAEA), Vienna whose inspectors regularly visit the plant.

An array of powerful TV cameras operating round-the-clock in the reactor room and around the "swimming pool" where the nuclear fuel is cooled, monitors every movement of men and materials to ensure that nuclear materials are not diverted to purposes other than the generation of electricity that courses through the KESC's grid.

CHASHNUPP also will be under similar IAEA safeguards and supervision.

To prove its bona fides, Pakistan has stated solemnly that it has no intention of producing nuclear weapons, it wants, in fact a ban on all nuclear weapons.

What else can one ask for? But, apparently, such is the invidious discrimination against Pakistan that it must be denied even the technology for the production of energy and its by-product. That the Western ban is patently unfair is clear from the fact that only Pakistan has been singled out for boycott.

PAKISTAN

REGIONAL MEETING ON ATOMIC ENERGY CONCLUDES

Karachi DAWN in English 29 Mar 85 p 3

[Text]

LAHORE, March 28: The seventh RCA working group meeting of the International Atomic Energy Agency included here on Thursday. Twenty participants from ten countries participated in the four-day meeting. China participated as an observer.

The meeting was chaired by Dr Ashfaq Ahmad, Member (technical) of the Pakistan Atomic Energy Commission.

In his concluding remarks, Dr Ashfaq appreciated the keen interest for regional cooperation evinced by participants during the course of the meeting.

He complimented the participants on the high quality of the technical discussions and their zest for promoting peaceful applications of atomic energy for the development of the region.

He said it was gratifying that the participants, drawn from diverse backgrounds, shared the common perception that their economic advancement could be accelerated by applying nuclear techniques in agriculture, industry and medicine.

Dr Ashfaq thanked Prof M. Zifferero, IAEA Deputy Director-General, for his support to the RCA programme.

Prof Zifferero described the meeting as very successful and thought it would be instrumental in forging closer links among the RCA states. He thanked the PAEC for making "excellent arrangements" for the meeting at its newly operational Institute of Nuclear Medicine and Oncology.

The Japanese delegate, Nobutoshi Miyazaki, assured the participants that his Government would continue to support the

RCA-UNDP projects, especially in the field of nuclear medicine and cancer therapy.

He added that in spite of serious budgetary constraints the Japanese Government would contribute about 394,000 dollars to the RCA programme this year.

Joon Keuk Chung, the delegate of the Republic of Korea, stated that the RCA greatly contributed to the development of the Korean nuclear programme. Nuclear power in his country has been considered the best all round and most reliable source to meet the energy demand.

He said food irradiation in Korea has reached the commercial stage. "We expect that next year we will begin to enjoy irradiated potatoes, onions and other food stuff", he added.

Zhu Jiang, observer from China, said that his country would soon join the RCA as a full-fledged member. He said due to the efforts made in the past 30 years, China has been able to build up a "comparatively complete system" of nuclear industry and research including uranium refining enrichment and metallurgy, uranium fuel element fabrication.

Pakistan delegate Dr N.M. Butt said Pakistan would like to extend the scope of its participation.

He said Pakistan has developed the expertise and established centres where training of scientists from RCA member states could be arranged. In particular, he named the Nuclear Institute for Agriculture and Biology (NIAB) at Faisalabad which could serve as a regional centre for the RCA countries.

Malaysian delegate Adnan Haji

Khalid stated that since its inception his country had been active in the regional cooperative agreement and had continued to participate and contribute to almost every project initiated under the framework of RCA.

Ms Wsana Navanugraha, delegate of Thailand, said some of the RCA projects in her country had been transferred from the experimental to the commercial scale. These, she added, included the radiation sterilization of medical products.

"Most of the projects are making progress and upgrading the standard of living of the nation", she said.

S.K. Mehta, delegate of India, said his country was fully aware of the advantage of RCA mainly in the development of nuclear science and technology and would always participate in the support the activities of the cooperation. He ob-

served that considerable progress had been made in recent times in the member-states in various areas in which they have also produced expertise.

Dr Mesbahul Karim, delegate from Bangladesh, said his country has already started receiving benefit from the coordinated research programme under the RCA.

Dr K.G. Dharmawardena, delegate from Sri Lanka, was happy to observe the steady progress made by the RCA programme. He felt that in addition to promoting nuclear activities in our region, the RCA has brought together scientists and other personnel engaged in nuclear activities in this region."

Dr P.L. Airey, delegate from Australia, spoke of the enthusiasm of many Australian scientists involved in RCA work. This spirit of doing something worthwhile augurs well for the future, he observed.

CSO: 5100/4745

PAKISTAN

DUTCH COURT UPHOLDS QADEER'S APPEAL

Karachi DAWN in English 29 Mar 85 p 18

[Text]

AMSTERDAM, March 28: An Amsterdam court on Thursday upheld an appeal by a Pakistani nuclear scientist against his conviction by a Dutch court in 1983 on charge of attempted nuclear espionage and quashed his prison sentence.

The scientist, Dr. Abdul Qadeer Khan, was sentenced in his absence by an Amsterdam court on November 14, 1983, to four years in jail for attempting to gain uranium enrichment technology in The Netherlands.

The appeals court ruled that the public prosecutor's office had failed to sufficiently ensure that its summons against Khan had arrived in Pakistan. The court declared the summons null and void and quashed the sentence.

It ruled that a new summons would have to be issued if the prosecution wanted to renew its charges against Khan.

During a hearing two weeks ago, Khan's lawyer said the accused had never received the summons and had read the prison sentence against him in a Pakistani newspaper. Khan was not present at the hearing and is in Pakistan.

Khan, who denied spying in a letter to the Dutch government, maintained he had been innocently convicted since no state secrets were involved. The data was accessible to anyone from engineering and electronics literature, his lawyer told the appeals court.

In passing sentence in 1983, the court said Khan had abused his position as a former member of the research centre by seeking information in letters from Pakistan to employees.—Reuters.

CSO: 5100/4745

PAKISTAN

ODDS SAID HEAVILY AGAINST CHASHMA POWER PLANT

Karachi DAWN in English 7 Apr 85 p 7

[Article by Mohsin Ali]

[Text]

THE statement of the Chairman of the Pakistan Atomic Energy Commission, Mr. Munir Ahmed last week that "Pakistan now hoped to build a larger 900 megawatt nuclear power plant by early 1990s" would, perhaps be widely interpreted as an expression of fervant optimism.

For plainly the odds against the plant coming on stream even 10 years hence are overwhelming.

Obviously, the Chairman of the Pakistan Atomic Energy Commission (PAEC) had the projected Chashma Nuclear Power Plant (CHASHNUPP) in mind when he addressed the delegates from 10 countries attending the seventh working group meeting of the Regional Co-operative Agreement of the International Atomic Energy Agency (IAEA) at Lahore.

In his inaugural address, Mr. Munir Ahmed Khan, according to the news agency report, said that "Pakistan now hoped to build a larger 900 megawatt plant by early 1990s and establish about 5,000 megawatt of nuclear capacity by the turn of the century."

"If these plans materialised", Mr. Khan went on, "nuclear power would meet about 25 per cent of electricity requirements by that time."

The difficulties

No one in Pakistan, however,

could possibly be more keenly aware of the difficulties of the task or the constraints shackling our efforts than the PAEC Chairman.

Take, for instance, the 900 MW Chashma Nuclear Power Plant (CHASHNUPP) at Chashma in the Mianwali district of the Punjab, the sanction for which was accorded by the Government of Pakistan three years ago.

CHASHNUPP, unlike the Karachi Nuclear Power Plant (KANUPP), is to use light water reactor which requires enriched uranium.

The KANUPP, it may be added, is heavy water moderated and uses natural uranium as fuel.

International tenders for Chashma were floated in 1983 and it was subsequently stated that the PAEC authorities were negotiating with several reactor suppliers in Europe.

Simultaneously, the American and the British Press reported that all Western reactor suppliers in the informal suppliers' club, were under heavy pressure from Washington to desist from providing any nuclear reactor, parts or equipment, to Pakistan.

In fact, presumably, the PAEC Chairman had these reports in view when in the same address to the Lahore meeting he put in an eloquent plea for the waiving of all restrictions on the transfer of nuclear technology from the industrialised countries to the developing ones.

In fact, we have it on good authority that Pakistani nuclear scientists, attending seminars or

symposia in the West, are often made to cool their heels in the ante-rooms while the rest of their colleague tour nuclear installations or plants.

Placed in a virtual academic quarantine as far as the pursuit of studies in nuclear science in the Western seats of learning are concerned, Pakistan was forced to establish its own courses of higher study and training at home.

The Centre for Nuclear Studies at the Pakistan Institute of Nuclear Science (PINSTECH) in Rawalpindi, for instance, had to institute M.Sc (Nuclear Engineering) courses in such subjects as nuclear reactor safety, nuclear chemical plant design, radiation shielding, radioactive waste management, environment engineering, and computer programming.

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fuel, spares even safety information to the KANUPP, designed, constructed and installed by the Canadian General Electric Company in 1965-72.

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Achievements

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This is no small achievement for a developing country with a narrow scientific base. The PAEC and its technical staff — there are several girls in the computer room — were thrown a challenge. They rose to meet it squarely.

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rials are not diverted to purposes other than the generation of electricity that courses through the KESC's grid.

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What else can one ask for? But, apparently, such is the invidious discrimination against Pakistan that it must be denied even the technology for the production of energy at Chashma.

That the Western ban is patently unfair is clear from the fact that only Pakistan has been singled out for boycott.

- France has agreed to supply Israel with two nuclear reactors.
- France is supplying the Tarapur reactor in India with enriched uranium.
- India has two nuclear plants at Tarapur and in Kota in western Rajasthan with a generating capacity of 890 megawatt. Two more stations at Narira in UP and near Madras are nearing completion.
- Soviet experts are currently conducting a site selection study for a nuclear power plant in Syria.
- China's first large nuclear power station at Daya Bay in Guangdong province would be constructed as a joint venture by China's Guangdong Power Company and the British-owned China Light and Power Company of Hong Kong.
- Turkey's first nuclear power plant, would be constructed at Akkuyu Bay. Bidding for it are the Atomic Energy of Canada Ltd and the Kraftwerk Union (KWU) of West Germany.
- Brazil's third and fourth nuclear plants are also to be constructed by the same German Kraftwerk Union (KWU).

PAKISTAN

INSTITUTE OF BIOTECHNOLOGY PLANNED

Karachi DAWN in English 24 Mar 85 p 8

[Text]

KARACHI, March 23: An Institute of Biotechnology and Genetic Engineering is proposed to be set up by the Pakistan Atomic Energy Commission (PAEC).

The Central Development Working Party (CDWP) has already approved the proposal for the establishment of the institute. It will now be considered by the EC-NEC at its next meeting due to be held shortly.

The proposed institute will help acquire and assimilate the current developments in biotechnology and genetic engineering for use in agriculture, energy, industry and health sectors.

Agricultural research at the institute would aim at the evolution of varieties with better characteristics, and development of fertiliser — conservation techniques.

Medical research would aim at the manufacture of special

pharmaceuticals, antibiotics, hormones, etc, in the energy sector, the research and development effort would concentrate on the conversion of biomass into methane and fuel alcohol. Mineral leaching of ores will form a part of the institute's research effort in the industrial sector.

Meanwhile, free drying equipment received at the Institute of Nuclear Medicine and Oncology (INMO), Lahore, is currently under installation. It will be used to prepare kits of different chemicals for labelling with TC-99m for imaging procedures in diagnostic nuclear medicine.

Radiopharmaceuticals prepared with the help of these kits will be used, to begin with, at INMO and the Atomic Energy Medical Centre, Lahore. As the production facilities improve, the kits will be supplied to other PAEC medical centres.—PPI

CSO: 5100/4741

SOUTH AFRICA

AEC DELAYS ESCOM RESTART OF NUCLEAR POWER PLANT

MB070925 Johannesburg SUNDAY TIMES in English 7 Apr 85 p 2

[Article By Neil Hooper]

[Text]The Atomic Energy Corporation (AEC) has banned Escom [Electricity Supply Commission] from restarting the Koeberg nuclear power station — closed down in January after faulty piping was discovered — until it is satisfied that the power station is "safe".

The estimated loss of revenue from the extended shutdown of the power station is likely to exceed r90-million before Koeberg is recommissioned.

The AEC clampdown on the plant was confirmed this week by both Escom and the Atomic Energy Corporation..

The Koeberg plant went off-stream in January this year after it was found that there were "iron inclusions" in an aluminium elbow joint of reactor unit number two.

An Escom spokesman said the commission had applied to the AEC about a week ago for permission to restart the plant because it was "satisfied the plant meets the safety requirements for which it was designed".

The spokesman said, however, that the AEC had "requested that the inspection (of potentially faulty piping) be extended to a wider range of pipe fittings which serve the primary circuit, before approval for start-up can be granted".

Escom said that the additional requirements of the AEC included the "ultrasonic testing" of the plant's aluminium piping, and that this could take "a few weeks".

The medical officer of health for Cape Town, Dr Reg Coogan, said yesterday that he was "very relieved" the AEC had taken "emergency steps" to stop the re-starting of the Koeberg plant until it was satisfied that the reactor met all safety requirements.

CSO: 5100/24

BELGIUM

PROGRESS, PROBLEMS IN NUCLEAR INDUSTRY, ELECTRICITY PRICE

Brussels LE SOIR in French 13/14 Apr 85 p 5

[Article by Guy Duplat: "The Belgian Nuclear Rose...and its Thorns"]

[Text] Every rose has its thorns. And the greatest successes sometimes have the grimmest reverses. Nuclear industry in Belgium is a fine illustration of these aphorisms. The resolute choice carried out fifteen or twenty years ago in favor of nuclear energy today bears its indisputable benefits, but on the other hand it brought about several rigidities which the Belgian political and economic system has some difficulty in overcoming.

During the 1960's, political leaders, the scientific community, industrial enterprises, and electricity producers were united in promoting, in practice, a strategy of nuclear development. For that, no parliamentary debate was needed since a consensus existed among all the interested parties. The first petroleum crisis confirmed the soundness of a policy of energy independence based on the atom.

Even ten years ago there was talk of building one nuclear power plant per year in Belgium...until the year 2000. Since the cooling capacities of Belgian rivers are limited, there were plans to construct islands in the North Sea which would shelter nuclear stockpiles. A slide arrangement even showed what a factory could be like which would mass produce nuclear power stations.

This euphoria was shared in political circles: André Olef, the minister for economic affairs, had great aspirations for Belgian nuclear industry.

They built on all sides: Chooz, Doel 1 and 2; Tihange 1; and then Doel 3 and 4; Tihange 2 and 3, and once again Chooz while awaiting a forthcoming Doel 5. Each year electricity producers invested between 30 and 40 billion Belgian francs annually in production and distribution without direct assistance from the state, since in Belgium electricity production is entirely private.

The state also made its financial contribution to this vast industrial project: sharing in the construction of an experimental supergenerator at Kalkar in Germany, granting subsidies to the nuclear power station at Mol, etc.

The amount of state investment is not inconsiderable since in 1985, at a time when the nuclear program is almost in abeyance, the state will again award a grant of 2.4 billion Belgian francs to the Mol nuclear power station, and half a billion for Kalkar. (Belgium should pay a total of around 10 billions into this highly controversial project.)

Despite this initial concensus, nuclear power development was hardly devised on the basis of an agreed plan. There are actually eight different models for the nine power stations built or under construction. Sometimes Belgians called on France, with Framatome; sometimes on the United States, with Westinghouse, and when two identical stations were purchased, the industrial architecture was turned over to two different research units. Belgium therefore was hardly able to take advantage of economies of scale or the effects of mass production.

Cheaper Electricity

All this development, all these investments today, bear their undeniable benefits.

All the major variables of energy policy are favorable. Nuclear energy saves Belgium's balance of trade 40 billions per year.

Energy independence has made a great leap forward. In 1973 petroleum and gas still constituted 83 percent of the fuel for the electric power stations in this country. This figure was to decline to barely 17 percent in 1985 while nuclear energy will power 58 percent of electricity production.

In 1984 the cheaper cost of nuclear electricity saved Belgian industrialists and consumers 10 billion Belgian francs. In 1977 the price of Belgian industrial electricity was the highest of a European panel composed of France, Germany, Great Britain, the Netherlands, and Italy; in six years it became the lowest, with the exception of France. Expressed in terms of the ECU (the European currency) the price of a Belgian kilowatt hour went from 42 in 1977 to 55 in 1983, while in the Netherlands this price zoomed up, going from 32 to 75 six years later, and in Great Britain it climbed from 29 to 70.

The availability rate of Belgian power stations, moreover, is one of the highest in the world.

Too Much Rigidity

The undeniable successes, however, should not obscure the negative aspects. The continued development of nuclear industry forecast 10 years ago has now given place to stagnation. The Belgian research centers which had lived -- well-- on a "captive" clientele are now confronted with serious reconversion problems. The order books of big industry, (ACEC, Cockerill-Sambre, Fabricom) which had heavily invested in nuclear energy, are not very flourishing. As for the many sub-contractors who, tempted by official promises, had counted on nuclear power, it only took them a little longer to see that lean times had come. The economic crisis and the slowing down of Belgian growth was for a time compensated by the illusion of exports. By turns, there was talk about

fabulous contracts in Brazil, Pakistan, Turkey, Libya, Egypt, etc. But the indebtedness of these countries and aggravated world competition give no grounds for optimism.

This industrial rigidity corresponds to a certain rigidity in the state. The latter is "burdened" with its Mol nuclear center, the Kalkar project, and the reprocessing factory about which it is still not known whether it will begin operations.

Another rigidity is that of supply and demand for electricity. The increased recourse to large production units forecloses the possibilities of greater decentralization, which could have proved very profitable. Combined production units, medium-sized coal-powered power stations, with fluid layers would not simply be an area of activity useful in Belgium but could be a useful instrument for exportation, in fact much more responsive to the requirements of developing countries. But to sell such units abroad national recommendations are required that are difficult to build up today. That rigidity is still there, the thorn of the nuclear rose.

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CSO: 5100/2552

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